PART 2 – SOFTWARE

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Introduction

Minimum PC Specifications

Consider a number of factors when determining the correct PC specifications for different scenarios. The Database Server usually has the highest specification requirements. Consider the following factors when specifying the Database Server:

- Number of doors (Terminals)
- Number of Tagholders supported by the System
- Number of client (Module) connections to the Database

Database Server

Tagholders (Users)	**0 - 1 000**	**1 000 - 5 000**	**> 5 000**
Doors	0 - 50	50 - 100	> 100
Processors (A high performance model released in the last 3 months)	1 Desktop Processor	1 - 2 Server Processor(s)	2 or more Server Processor(s)
Free Memory (For use by the Database Server only)	1 GB	2 GB	4 GB
Free Hard Disk Space (For Database storage, backup and archived copies)	80 GB	160 GB	320 GB
Validated Operating Systems	Microsoft Windows 7 (64-Bit and 32-Bit) (Professional, Enterprise or Ultimate) Microsoft Windows Vista (Business or Ultimate) Microsoft Windows XP Professional Microsoft Windows 2003 (Only with SQL Server)	Microsoft Windows 7 (64-Bit and 32-Bit) (Professional, Enterprise or Ultimate) Microsoft Windows Vista (Business or Ultimate) Microsoft Windows XP Professional Microsoft Windows 2003 (Only with SQL Server)	Microsoft Windows 7 (64-Bit and 32-Bit) (Professional, Enterprise or Ultimate) Microsoft Windows Vista (Business or Ultimate) Microsoft Windows XP Professional Microsoft Windows 2003 (Only with SQL Server)
Supported Database Server Platforms	Firebird Microsoft SQL Server 2008 R2 (Express Edition) Microsoft SQL Server 2005 (Standard Edition) Microsoft SQL Server 2000 SP4	Firebird Microsoft SQL Server 2008 R2 (Express Edition) Microsoft SQL Server 2005 (Standard Edition) Microsoft SQL Server 2000 SP4	Microsoft SQL Server 2008 R2 (Express Edition) Microsoft SQL Server 2005 (Standard Edition) Microsoft SQL Server 2000 SP4

Figure 1 – Database Server

The number of client connections to the Database Server will affect the performance of the Database Server. Adjust the specification allowing for all client connections to perform Database tasks efficiently.

The volume of transactions per Site affects the performance of the Database Server. Adjust the specification allowing for rapid Database growth and Reports that work with large result sets.

This specification is for a dedicated Database Server only, without additional Software (third-party or ImproNet Modules).

ImproNet Module PC's

Ensure that you install all ImproNet Modules on dedicated PC's.

Tagholders (Users)	**0 - 1 000**	**1 000 - 5 000**	**> 5 000**
Doors	0 - 50	50 - 100	> 100
Processors (A high performance model released in the last 3 months)	1 Desktop Processor	1 Desktop Processor	1 Desktop Processor
Free Memory (For use by each Software Module only)	512 MB	768 MB	1 GB
Free Hard Disk Space (For Database storage, backup and archived copies)	80 GB	80 GB	80 GB
Validated Operating Systems	Microsoft Windows 7 (Professional, Enterprise or Ultimate) Microsoft Windows Vista (Business or Ultimate) Microsoft Windows XP Professional	Microsoft Windows 7 (Professional, Enterprise or Ultimate) Microsoft Windows Vista (Business or Ultimate) Microsoft Windows XP Professional	Microsoft Windows 7 (Professional, Enterprise or Ultimate) Microsoft Windows Vista (Business or Ultimate) Microsoft Windows XP Professional

Figure 2 – Standard Software Modules (Engine, Access (including Card Designer), QuickTag, Visitor, Transaction Viewer, Alarms Client)

Tagholders (Users)	**0 - 1 000**	**1 000 - 5 000**	**> 5 000**
Doors	0 - 50	50 - 100	> 100
Processors (A high performance model released in the last 3 months)	1 Desktop Processor	1 Desktop Processor	1 Desktop Processor
Free Memory (For use by each Software Module only)	768 MB	1 GB	2 GB
Free Hard Disk Space (For Database storage, backup and archived copies)	160 GB	160 GB	160 GB
Display (Monitor and graphics accelerator)	1 024 x 768 128 MB On-board RAM	1 024 x 768 128 MB On-board RAM	1 024 x 768 128 MB On-board RAM
Validated Operating Systems	Microsoft Windows 7 (Professional, Enterprise or Ultimate) Microsoft Windows Vista (Business or Ultimate) Microsoft Windows XP Professional	Microsoft Windows 7 (Professional, Enterprise or Ultimate) Microsoft Windows Vista (Business or Ultimate) Microsoft Windows XP Professional	Microsoft Windows 7 (Professional, Enterprise or Ultimate) Microsoft Windows Vista (Business or Ultimate) Microsoft Windows XP Professional

Figure 3 – Optional Client Software Modules (Graphics Designer, Graphics Runtime)

Tagholders (Users)	**0 - 1 000**	**1 000 - 5 000**	**> 5 000**
Doors	0 - 50	50 - 100	> 100
Processors (A high performance model released in the last 3 months)	1 Desktop Processor	1 - 2 Server Processor(s)	2 or more Server Processors
Free Memory (For use by each Software Module only)	1 GB	2 GB	4 GB
Free Hard Disk Space (For Database storage, backup and archived copies)	160 GB	160 GB	160 GB
Validated Operating Systems	Microsoft Windows 7 (Professional, Enterprise or Ultimate) Microsoft Windows Vista (Business or Ultimate) Microsoft Windows XP Professional	Microsoft Windows 7 (Professional, Enterprise or Ultimate) Microsoft Windows Vista (Business or Ultimate) Microsoft Windows XP Professional	Microsoft Windows 7 (Professional, Enterprise or Ultimate) Microsoft Windows Vista (Business or Ultimate) Microsoft Windows XP Professional

Figure 4 – Optional Server Software Modules (Impro Touch, Impro Vision)

The number of third-party devices that are used by each optional Server affects the performance of the System. Adjust the specification to allow the optional Servers to run at an optimal level.

The number of client connections to each optional Server affects the performance of the System.

Known Issues

- There are known isolated cases of ImproNet not installing correctly on some **Dell** PC's

ImproNet Applications

The ImproNet Software Suite consists of a collection of Modules and Utilities.

The Modules form the core of the ImproNet Suite and provide control for everyday and important functions. The Utilities provide support for advanced configuration and system maintenance. This section provides a brief description of the ImproNet Modules and Utilities.

ImproNet Modules

It is possible to run the entire ImproNet Software Suite on a single PC. However, the Suite is designed to operate on multiple PC's in a Client-Server configuration. Therefore, to ensure correct functioning, it is essential to have dedicated PC's as specified in this Manual.

The configurable aspect of the ImproNet Modules enables efficient operation in LAN and WAN infrastructures; each ImproNet Module performs a specific function.

Access Module

ImproNet Access is the configuration module for ImproNet. It performs a number of important functions including:

- Site and Host configuration.
- Hardware configuration – enables an installer to define and configure ImproX hardware such as Terminals and Controllers.
- Tagholder Access Group configuration. The key element of access control – a Tagholder Access Group is a combination of **when** (Access Time Patterns) and **where** (Areas) Tagholders have access.
- The Live Video Image Capture feature enables capture of photographs of Tagholders using live video from a web camera. Photographs captured in this way are inserted into the stored Tagholder data and displayed in the Add Tagholder or Edit Tagholder screens for that Tagholder.
- Photographs (in suitable formats) can also be loaded from files and inserted in the same way.
- Batch card printing is a feature of this Module.

Engine Module

ImproNet Engine is the communications Module. It is required to do the following:

- Monitor the Database for edits made by ImproNet client applications such as ImproNet Access, or QuickTag. Edits or changes are communicated to the ImproX Controllers.
- Polls the ImproX Controllers for transactions, then logs the transactions to the ImproNet Database.

- Runs the ImproNet Reports web server.

Engine must be running for Web Reports to run.

- Open socket connection ports for Modules such as ImproNet Graphics, which make a direct connection to the Engine.

Web-based QuickTag Module

The web-based QuickTag Module is intended for use for example, by an operator using a PC at a location remote from the System's Access Host PC. This Module requires no extra ImproNet software installation, simply installing Java Runtime Environment V1.60 and above allows any member of your staff access to the Module.

The Module's basic function is enrolling Tags so employee Tagholders and visitor Tagholders may access selected areas at named times. As this is an enrollment Module, each PC running the web-based QuickTag Module must connect to a Registration Reader.

The benefit of running this now entirely web-based Module, is less bandwidth usage promoting improved network speed.

You may use the web-based QuickTag Module with Windows® Internet Explorer 7 (and above) or alternatively Firefox 2 (and above).

QuickTag Module

The QuickTag Module is intended for use for example, by an operator using a PC at a location that is remote from the System's Access Host PC. This Module could typically be installed on a PC in the Reception Area. The QuickTag Module is a rapid Tagholder/Tag entry Module for enrolling both Employee and Visitor Tagholders into the Access Control System. This Module's basic function is to add Tags so Employees and persons visiting the company may have access to selected areas at named times.

This Module also allows the Supervisor to disable certain editing features, thus improving the security of this Module. By disabling these features, the operator has limited access and therefore cannot change any sensitive setting in the System. Each button within the application can be disabled.

The Live Video Image Capture feature enables capture of photographs of Tagholders using live video from a web camera. Photographs captured in this way are inserted into the stored Tagholders data and displayed in the Add Tagholder or Edit Tagholder screens for that Tagholder. Photographs (in suitable formats) can also be loaded from files and inserted in the same way.

Visitor Module

The Visitor Module is designed to be used, for example, by an operator using a PC remote from the Systems Access Host PC. This Module could typically be installed on a PC in the Reception Area. The Visitor Module is a rapid Tagholder/Tag Entry Module for enrolling Visitors into the

Access System. It is intended to be a front-desk, Reception area, application. This Module's basic role is to add Tags so persons visiting the company may have access to selected areas at specified times.

This Module also has the facility of setting up Visitors' Tags so that they cannot gain access to a door unless a Host Employee first presents a Tag, after which the Visitor's Tag should be presented within ten seconds. This facility enhances the security of the company by not allowing Visitors to walk freely into sensitive non-Visitor areas.

Graphics Designer Module

Used to create graphical plan representations of Sites, buildings, offices, car parks, and so on within a Site. Graphics Designer permits the arranging of icons that represent buildings on a Site map, and icons that represent ImproX hardware units on Floor Plans within those buildings. We suggest that Graphics Designer be installed on a secure PC to limit the possibility of the setup being tampered with.

Graphics Runtime Module

This Module provides real-time graphical monitoring of the Site. This Module can be used to display alarms from related systems such as Ziton or CaddX, and to acknowledge these alarms. Initial set-up is made via the Graphics Designer Module. At Runtime the operator chooses which Ground Plan or Floor Plan to display. Thereafter the operating actions are limited to responding to any alarm displays, finding the last known position of a Tagholder, displaying transactions and so on.

Card Designer Module

The Card Designer Module allows the user to design templates for use with Credit Card Tags. These templates can then be used to print information on to these tags, such as company name, Tagholder's name, ID number, employee number, department, barcode, etc, as well as a photograph of the Tagholder. The related batch card printing is a feature of the Access Module.

Tracker Module

The Tracker Module keeps you advised as to the whereabouts of selected Tagholders (maximum 10 Tagholders per site) as they move about the Site. Alternatively, you may use the Tracker Module to monitor events at a selected Reader (maximum 10 Readers per Site). Both these facilities allow for better end user site management, by displaying the latest 20 transactions for today only, in time order per your group (Tagholders or Readers) selected.

*In instances where a single Tagholder (Reader) returns more transactions than others it may happen that some Tagholders (Readers) do not appear in the list of transactions. It must be emphasized that it is the **most recent 20 transactions for the group**, not the most recent for each individual Tagholder. Achieve best results with this Module by narrowing your range for monitoring to your exact requirements.*

On opening, the Tracker Module remains discreetly minimized as an icon in the System Tray (Notifications Area). As Tracker receives Tagholder transactions or events from Monitored Readers, notification pop-up windows display in the Notification area.

By default the Tracker Module refreshes every 10 seconds, this is the recommended setting. The refresh rate is, however, user configurable where you need a faster or slower refresh rate.

Alarms Module

This Module provides real time monitoring of alarm transactions and acknowledging of alarms.

Transaction Viewer Module

The Transaction Viewer client Module gives a live real-time view of all types of transactions in the System. It displays the names of the access points (Locations) and details of the persons who have entered or exited those Locations. The process can be set to monitor the whole Site, or just a selected Zone or access point. The Module supports Tagholder image display as well. The Transaction Viewer client process may be run on any machine on the network and more than one Module can run simultaneously.

Custom Access Module

The Custom Access Module works in conjunction with the Access Module. Where the Access Module allows access to Tagholders based on Access Time Patterns and Tagholder Access Groups the Custom Access Module uses its own set of rules for granting or denying access.

As a third-party validation system, the Custom Access Module connects via TCPIP Client Socket connection to the started Engine Module. The Custom Access Module listens for all third-party transactions coming from all Engines' Sites. Based on the Custom Access Module's own set of user defined rules, the Module allows or denies the transaction.

Ziton Server Module

This Module interfaces the third-party Ziton Fire Alarms system to ImproNet. The Impro Ziton Server permits alarms from one or more Ziton Fire Alarm Panels to be displayed on, and acknowledged from, the associated Floor Plan in the Graphics Runtime Module.

CaddX Server Module

This Module interfaces the third-party CaddX Alarm system to ImproNet. The CaddX Server Module displays alarms from CaddX Alarm Panels. Acknowledgement of alarms takes place from graphics Floor Plans in the Graphics Runtime Module.

DVR Server Module

The DVR Server Module controls the operation of a related iNet DVR, or Vista CCTV surveillance system. This Module lets the ImproNet operator select cameras, zoom, pan, and perform other functions in the CCTV system using the ImproNet Graphics Runtime Module.

Ganz Server Module

The Ganz Server Module allows integration of Ganz CCTV surveillance systems with the ImproNet Software.

ImproVision Integration Module

The ImproVision Integration Module is a rule-action based Module. This essentially means a matched rule must trigger for execution of up to 5 actions. Born as a Digital Video Recorder based system, for interfacing Digital Video Recorders direct to the ImproNet's Graphics Designer and Graphics Runtime Modules, ImproVision's interface capabilities now include other third-party devices (including Lift Servers and Alarm Panels).

ImproVision's digital video recording and monitoring integration facilities include:

- Integration with **Mirasys V/N Series** Digital Video Recording (DVR) equipment.
- Integration with **Dedicated Micros** Digital Video Recording (DVR) equipment.

Biometric Server Module

Embedded in the ImproNet Software, the Biometric Server Module integrates selected biometric readers into an ImproNet System. This Module uses a centralized Database, and permits the user to add, edit or delete bio-templates. This Server is part of the Impro Touch concept.

ImproNet Utilities

Archive Utility

The Archive Utility enables you to create copies of the ImproNet Database on specified dates. You can use these Database copies to generate transaction reports for a particular historical period. Running Archive also decreases the size of the ImproNet Database.

Database Upgrade Utility

This Utility enables automatic updating of the ImproNet Database. The Utility checks for available update scripts and processes them automatically.

IBConsole Utility

IBConsole is a third-party database configuration and administration tool. You can use IBConsole to perform advanced configuration and administration tasks on the ImproNet Database.

Import Utility

This Utility is used to import comma separated value (CSV) files into the ImproNet Database. You can use it to import data such as employee records from other applications, to the ImproNet Database.

Find Duplicates Utility

Importing CSV files into the ImproNet Database can result in duplicate records. The Find Duplicates Utility enables you to search the Database for, and delete duplicate records.

IXP200 Conversion Utility

The IXP200 Conversion Utility facilitates conversion of an IXP200 Database to an ImproNet Database.

This Utility converts user data only. Ensure that you reconfigure Site information in ImproNet.

Pump Utility

Pump transfers user-defined data from the existing ImproNet Database to a new empty database when ImproNet is upgraded to a new version.

Translate Utility

This Utility facilitates changing the field names in the ImproNet Database to words of another language. The Translate Utility requires you to manually enter replacement text.

Unlock Utility

The Unlock Utility enables you to activate applications that are otherwise disabled. You do this by entering a code called a *Product Unlock Key* into the Utility.

Ethernet Configuration Utility

Communications between the Host PC and the ImproX EC uses Ethernet protocols. The ImproX EC must be configured for the Ethernet protocol in use on the LAN/WAN, using the Ethernet Device Configuration Utility software. The Ethernet security and operational settings for the ImproX EC are also configured in the Ethernet Device Configuration Utility.

Discovery Utility

The Discovery Utility allows the following actions:

- Detection of Controllers (System Controllers) on the network.
- Detection of Terminals (Door Controllers) on the network.
- Configuration of network address settings.
- Configuration of the Controller's settings.
- Configuration of the Terminal's settings.

Firmware Upgrade Utility

The Firmware Upgrade Utility lets you perform the following actions:

- Identify Firmware versions of connected Hardware.
- Selection and configuration of Communications Port.
- You may Ping the connected Hardware (feedback informs you of whether Hardware is connected and working as specified).
- Perform in-field Firmware Upgrades to connected Hardware.

Manual Auto-ID Utility

This Utility lets you add Controllers and Terminals not previously added in Access. You may also edit selected Controller and Terminal properties (for example: Site SLA, Unit Type, Fixed Address, Controller LA and Terminal LA) or delete Controllers and Terminals.

Universal Data Export Utility

The Universal Data Exporter Utility lets you extract transaction (including time and attendance) records from the ImproNet Database for use by third-party applications.

The Exporter Utility makes use of user defined templates (created in Design Mode) that specify the data for extraction and the export format. Using the Run Mode, you have the choice of exporting the records interactively or as scheduled (using Windows® Scheduler). Command line arguments specify the Mode and other parameters.

Peripheral Hardware

ImproNet uses various peripheral hardware devices to perform a software protection function. Some ImproNet Modules search for these devices on start-up. If the required device is not present, the Module does not run. Some devices also perform Tag enrollment and communication functions.

USB Enrollment Readers are compatible with ImproNet Software Suite V6.44 or later only.

	Device Description
	The **ProxMate** performs a Tag enrollment and software protection function. The ProxMate connects directly to the PC's RS232 serial port or to the Host Interface that connects to the PC. There are two versions of the ProxMate: • **INS900**—bundled with the INS904 software package. The following Software Modules run with the ProxMate: Access, QuickTag, Visitor, Graphics Designer and Graphics Runtime. An additional unlock code is required if the ProxMate is required to run on the iNet DVR integration. • **XPM912 Utility ProxMate**—generally used when ImproNet Modules are required to run on multiple PC's. The Utility ProxMate enables you to run the following Modules: QuickTag, Visitor, Graphics Designer and Graphics Runtime. The Utility ProxMate requires an additional unlock code to run ImproNet Access.
	The **Host Interface** carries out the following functions: • Acts as an RS232 to RS485 converter. • Performs a software protection function. • Facilitates inter-controller communications.
	The **ImproX RH** is a USB version of the Host Interface. It is used as an RS485 to USB converter and for Software protection (Engine needs connection to an RH at start-up). The ImproX RH facilitates inter controller Communications. Connect the ImproX RH to an external battery backed-up (10 to 30 V DC) power supply thus ensuring inter controller communications is maintained during a power failure or PC reboot. The ImproX RH does not support the ProxMate; however you may connect the ImproX RRA or ImproX RRM (supports the enrollment of 125 kHz or MIFARE® Tags respectively).

	Device Description
	The **ImproX RS** enables third-party readers such as Barcode and Magstripe readers, to interface with the ImproNet System as enrollment readers. The RS also performs a software protection function for the same Modules supported by the Utility ProxMate, that is QuickTag, Visitors, Graphics Designer and Graphics Runtime.
	The **ImproX MDE** is an external Enrollment Reader that connects direct to the USB Port of the PC. The ImproX MDE performs the following dual function: • Authentication device—interfacing with the ACCESS Software Module on the various Database platforms. And interfacing only with the UTILITY Software Modules across the Firebird and SQL Server Database platforms. • Registration of *125 kHz* and *13.56 MHz* Tags.
	The **ImproX RRA** is an external Enrollment Reader that connects to an ImproX RH or ImproX RS. The ImproX RRA reads *125 kHz* Tags.
	The **ImproX RRM** is an external Enrollment Reader that connects to an ImproX RH or ImproX RS. The ImproX RRM reads MIFARE® *13.56 MHz* Tags.
	The **ImproX B-SHO USB Fingerprint Enrollment Reader** and **ImproX B-SHO BioMini USB Fingerprint Enrollment Reader** are external enrollment readers that connect direct to the USB Port of the PC. These Enrollment Readers allow for registration of **fingerprints** for use by ImproX B-SHO Fingerprint Terminals. For more information on the use of these products with the ImproNet System, refer to Part 8 – Integration Modules.

Table 1 – Peripheral Hardware

ImproNet Network Specifications

The ImproNet Suite is designed to run over a network in Client-Server mode. However, it *can* also run successfully on a single PC.

Architecture

Bandwidth Usage

The following table outlines the estimated completion time (bandwidth usage) when uploading information from the Database to the Controller using TCP/IP.

Engine Action	Connection	Controller Quantity	Terminals per Controller	Tag Quantity	Transactions per Minute	Average Mbps	Bytes Sent and Received	Firebird Test Time	SQL Test Time
Auto-ID	Engine - Controller	1	1	NA	0	0.001	2 939	00:00:18	00:00:17
Auto-ID	Engine - Controller	5	1	NA	0	0.005	29 395	00:00:43	00:00:43
Auto-ID	Engine - Controller	10	1	NA	0	0.01	96 340	00:01:16	00:01:10
Full Upload	Engine - Controller	1	1	1	0	0.008	5 967	00:00:06	00:00:05
Full Upload	Engine - Controller	5	1	1	0	0.028	43 205	00:00:12	00:00:11
Full Upload	Engine - Controller	10	1	1	0	0.045	112 400	00:00:19	00:00:15
Full Upload	Engine - Controller	10	1	500	0	0.127	525 860	00:00:35	00:00:30
Full Upload	Engine - Controller	10	1	5 000	0	0.183	4 249 720	00:03:45	00:01:38
Full Upload	Engine - Controller	10	1	10 000	0	0.147	8 396 388	00:08:43	00:02:32
Full Upload	Engine - Controller	10	1	100 000	0	0.02	83 588 940	01:11:47	00:18:00
Engine Started	Engine - Controller	10	1	500	3 000	0.011	NA (Note 1)	00:01:00	00:01:00
Engine Started	Engine - Controller	10	1	5 000	6 000	0.011	NA (Note 1)	00:01:00	00:01:00
Engine Started	Engine - Controller	10	1	10 000	6 000	0.011	NA (Note 1)	00:01:00	00:01:00
Engine Started	Engine - Controller	10	1	100 000	6 000	0.011	NA (Note 1)	00:01:00	00:01:00
Full Upload	Engine - Database	10	1	5 000	0	1.173	13 717 304 (Note 2)	00:05:52	00:01:33
Full Upload	Engine - Database	10	1	10 000	0	0.97	27 309 190 (Note 2)	00:08:43	00:03:45
Full Upload	Engine - Database	10	1	50 000	0	1.063	134 751 419 (Note 2)	00:32:03	00:16:54
Full Upload	Engine - Database	10	1	100 000	0	0.906	271 177 044 (Note 2)	01:11:47	00:39:54
Full Upload	Engine - Database	10	1	300 000	0	0.986	813 531 132 (Note 2)	05:12:23	01:55:56

BandwidthUsage.jpg

Figure 5 – Bandwidth Usage Matrix

*Note 1—This **Bytes Sent and Received** information is not required as the test only shows the average data usage over a given time period.*

*Note 2—These **Bytes Sent and Received** figures refer to SQL Server.*

Client-Server

Client-Server architecture consists of users' PC's (Clients) connected via a network to a central host (Server). In most situations, Client PC's are workstations that access files or databases, or applications running on one or more Servers. In ImproNet, the Engine and Database are the **Server** components. The rest of the applications are **Client** components.

Software Connection Relationships

The following diagram shows the relationship between the ImproNet Database and ImproNet Client applications.

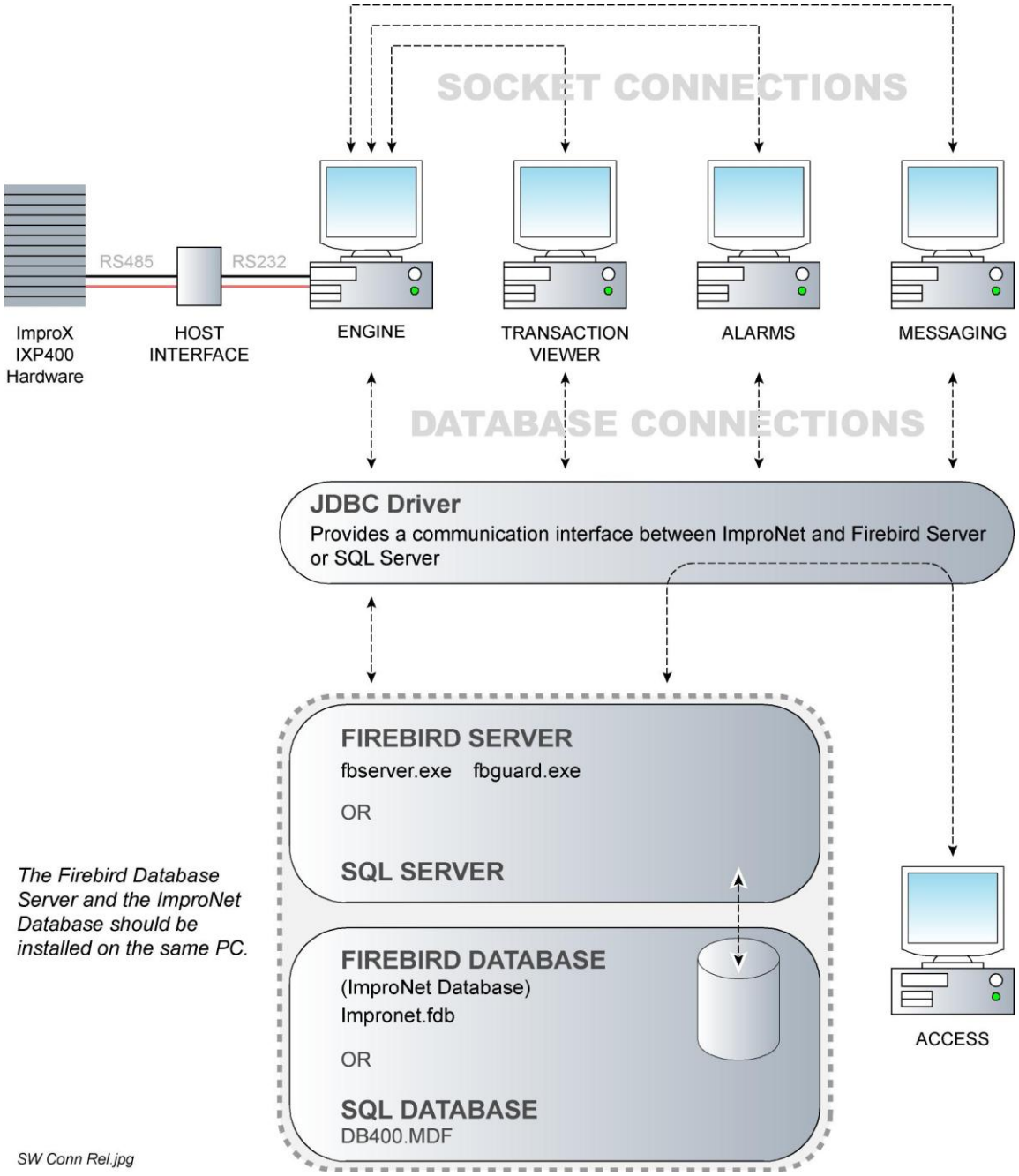


Figure 6 – Software Connection Relationships Diagram

Socket connections enable communication between PC's. **Database connections** enable communication between PC's and the ImproNet Database. **Jaybird** is an interface component installed with the Firebird database; it facilitates database interaction.

Network Hardware

An ImproNet compatible network requires **CAT5** or **CAT6 UTP** cabling and a **100 Mbps** or faster, **TCP/IP** enabled Network Interface Cards (NICs).

The ImproX ECII is rated to 100 Mbps, however the Controller will work on a 1 000 Mbps (1 GB) network.

Routers

If routers or switches are used, they must conform to the **TCP/IP** protocol operating at **100 Mbps** or faster.

ImproNet Modules in a Network Environment

The ImproNet Suite is designed to run over a network in Client-Server architecture. However, all Modules can run on a standalone PC if required. The following components are important when running ImproNet over a LAN or WAN:

- ImproNet Database
- Firebird Database Server or SQL Server
- ImproNet Engine

ImproNet Database

By default, ImproNet uses a **Firebird** Database. Firebird installs with ImproNet during the Software installation process. By default the Database installs at C:\ImproNet\Database. **Impronet.fdb** is the name of the database file.

Firebird is an open-source product—it has no licensing fee. For more information refer to the following websites: www.opensource.org and www.firebirdsql.org.

Firebird Server

Firebird Server is a Database Server program that facilitates connections between the **ImproNet Database** and ImproNet Applications such as **Engine** and **Access**.

Firebird Server must be installed in the same PC as the ImproNet Database.

SQL Server

SQL Server is a Database Server program that facilitates connections between the **ImproNet Database** and ImproNet Applications such as **Engine** and **Access**.

ImproNet Engine

ImproNet Engine functions primarily as a **Communication Server**. It performs the following functions:

- Retrieves transactions from ImproX Controllers.
- Monitors the ImproNet Database for changes.
- Communicates Database changes to the ImproX Controllers.

Some Client Applications, such as **Graphics Runtime**, **Transaction Viewer**, and **Alarms**, process and report information in real-time. To do this, they use **TCP/IP** socket connections to connect to the Engine. Socket connections are also used to send messages to ImproNet Engine. For example, when Graphics Runtime initiates a **Door Unlock** command, it is sent to the Engine via a socket connection. The Engine then sends the command to the Access Control hardware. Table 2 displays the **Socket Ports** used by ImproNet.

Ports	Port Number
Transaction	26663
Alarm	26661
Messaging	26665
Host Validation	26669
Door Status	26667
Firebird Server	3050

Table 2 – ImproNet Socket Ports

You can configure Socket Ports in ImproNet Access.

The following ImproNet Client Modules connect to the Engine, or the ImproNet Database, or to both.

- Access
- QuickTag
- Visitor
- Alarms
- Transaction Viewer
- Graphics Designer
- Graphics Runtime

General Network Requirements

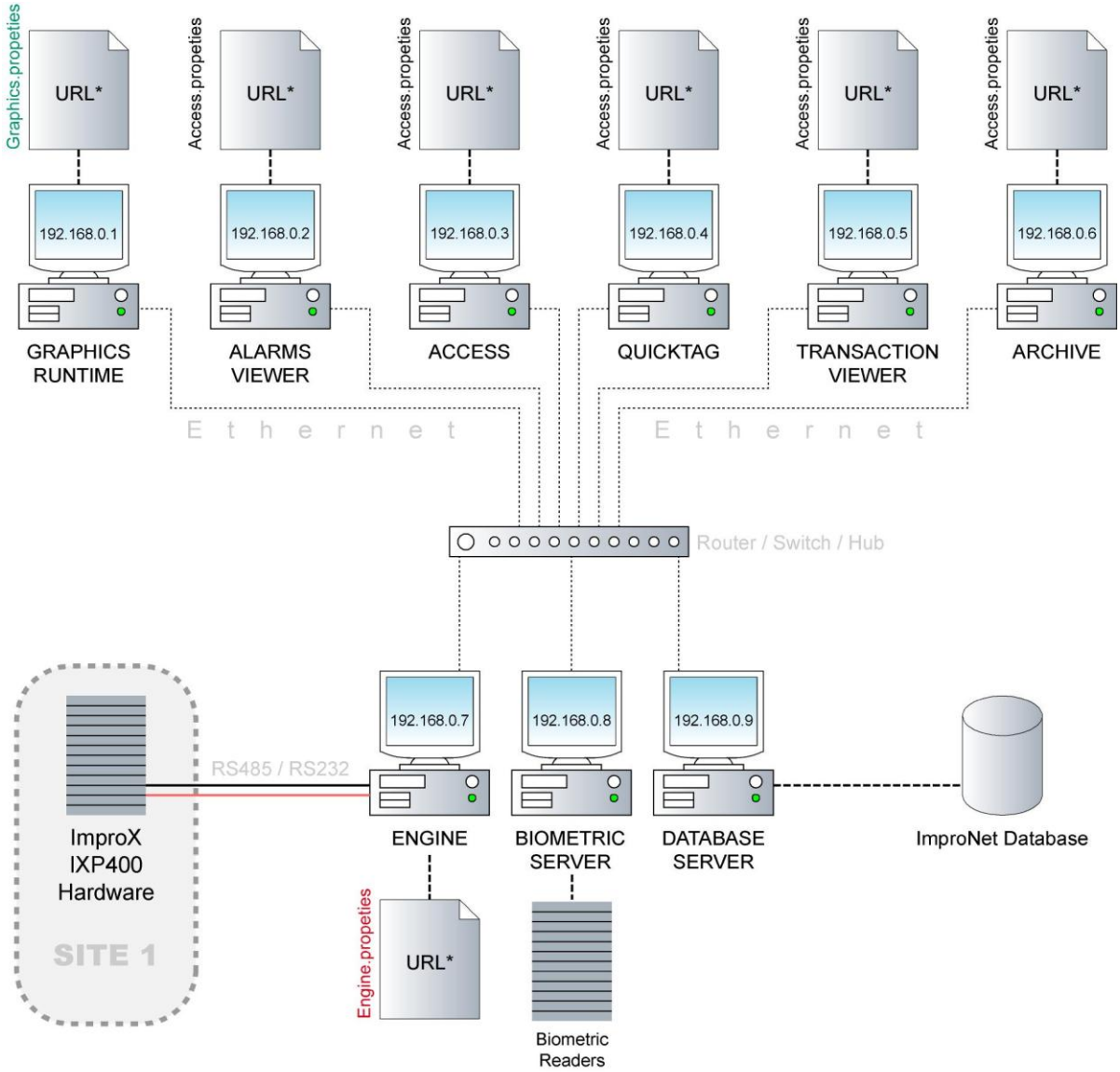
The following requirements are essential for ImproNet to operate over a network:

- Network hardware must support the **TCP/IP** protocol
- The network must support **100 Mbps** bandwidth or greater

The ImproX ECII is rated to 100 Mbps, however the Controller will work on a 1 000 Mbps (1 GB) network.

Running ImproNet Applications across a LAN

Figure 7 illustrates the network configuration for running ImproNet across a Local Area Network (LAN).



Firebird URL* = jdbc:firebirdsql:192.168.0.9:C:/ImproNet/Database/Impronet.fdb
SQL Server URL* = jdbc:jtds:sqlserver://localhost/DB400

Config LAN.jpg

Figure 7 – ImproNet Configuration across a LAN

Running ImproNet Applications across a WAN

Figure 8 illustrates the network configuration for running ImproNet across a Wide Area Network (WAN).

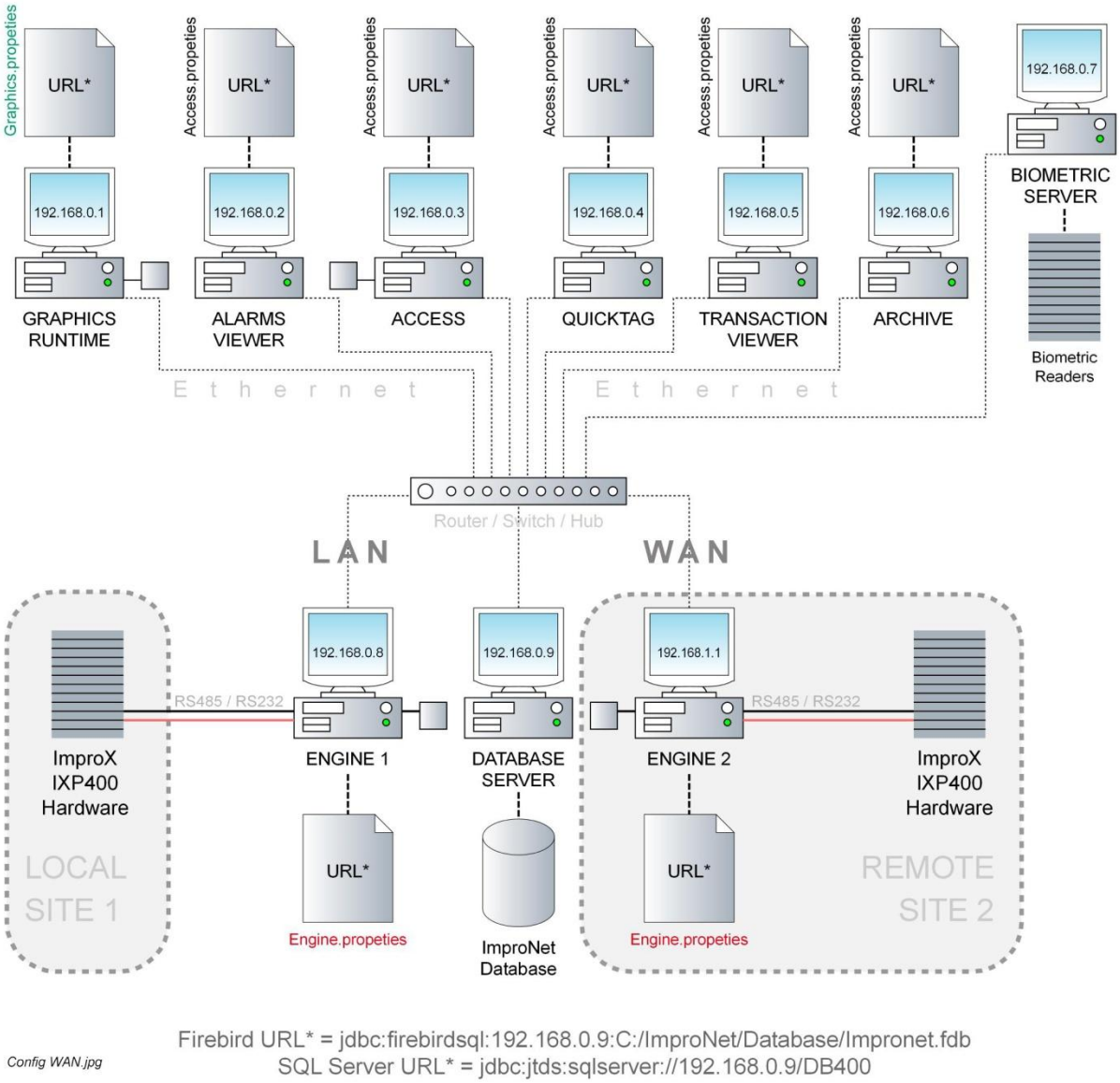


Figure 8 – ImproNet Configuration across a WAN

Communication across a WAN is generally slower than across a LAN. Therefore, a WANs performance must be carefully assessed before ImproNet is implemented across it.

Minimum WAN Requirements

An Engine, and the Controllers the Engine communicates with, needs a minimum throughput of 1 Mbps. For example, a WAN capable of 2 Mbps bandwidth, must assign at least 1 Mbps for exclusive use by the Engine and Controllers.

Properties Files

ImproNet Client applications store their connection settings in editable text files called **Properties Files**. These files contain URLs that specify the location of the Database Server. If the URL is incorrect, the application will not function.

Properties Files are stored in the ImproNet root folder. The following applications have their own Properties files:

- Access
- Archive
- Engine
- Graphics
- Pump
- Biometric
- Web Reports
- Web-base QuickTag

The files have the same name as their application. For example, the Properties file for ImproNet Access is called **Access.properties**, and is stored in **C:\Impronet**.

Other ImproNet applications including **QuickTag**, **Visitor**, **Alarms** and **Transaction Viewer** use the **Access.properties** file.

*There is one **Access.properties** file per PC.*

Configuring Modules for a Stand-Alone (Single PC) System

This section provides the requirements for installing all ImproNet Modules, including the Database Server, on a single PC.

Connecting to the Database

The ImproNet Suite installs by default to **C:\Impronet**. The URL in each Client **Properties File** points to the following default Database location C:\Impronet\Databases\Impronet.fdb.

If you move the Database to another location on the PC, you must change the URL in each Properties file to point to the new Database location.

For security reasons, we recommend that you do not share the Database folder.

The following code is the default format for the Database URL:
access.database.Interbase.URL=jdbc:firebirdsql://localhost/C:/ImproNet/Database/Impronet.fdb
If you move the ImproNet Database, you must update this code to reflect the new location.

For example, if you move the **IMPRONET.FDB** file to a folder called **Site1** on drive **D**, change the URL to *access.database.Interbase.URL=jdbc:firebirdsql://localhost/D:/Site1/Impronet.fdb.*

If other ImproNet Applications are installed on the Database Server, the URLs in each Client Properties File must use a local path, not a network path.

Configuring Modules for a LAN (Firebird)

If ImproNet Modules are distributed across a LAN, Properties files must be edited to point to the Database Server PC, and the location of the Database on the PC.

Connecting to the Database

Figure 9 shows an example of the **Engine.properties** file when ImproNet is installed over a network.

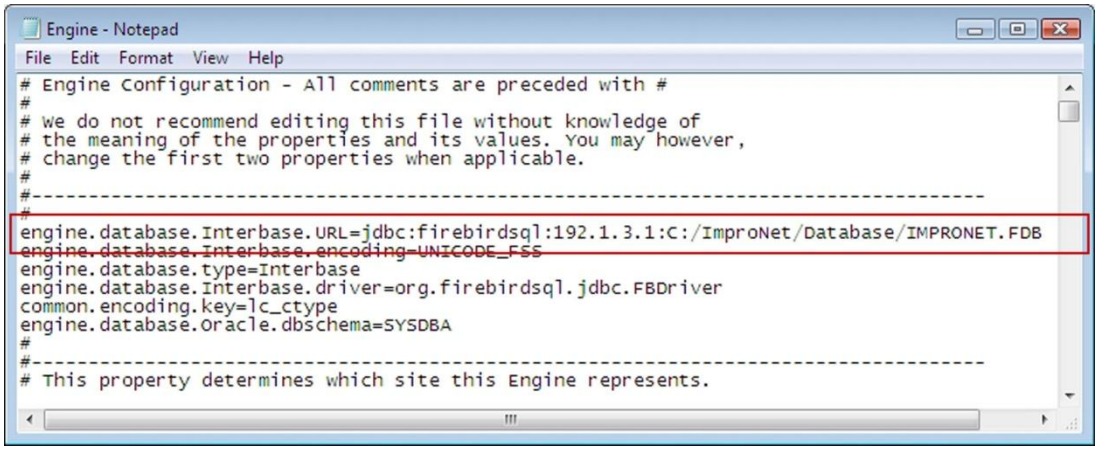


Figure 9 – Edited Engine Properties File

In Figure 9, the Database resides on a PC with an IP Address of **192.1.3.1**. In a stand-alone configuration, the default computer address is always **Localhost**. In a networked environment, replace **Localhost** with the **IP Address** or **Machine Name** of the Database Server.

Configuring ImproNet for a Microsoft SQL Server 2000 Database

*Microsoft SQL Server 2000 will NOT run on the **Windows® Vista** platform.*

*If using the **Windows® XP** platform ensure that you run Microsoft SQL Server 2000 with, at minimum, Service Pack 4 installed.*

Configuring Microsoft SQL Server for ImproNet

1. Open the **SQL Server Enterprise Manager** from **SQL Enterprise Manager**>**Console**> **Microsoft SQL Servers**.

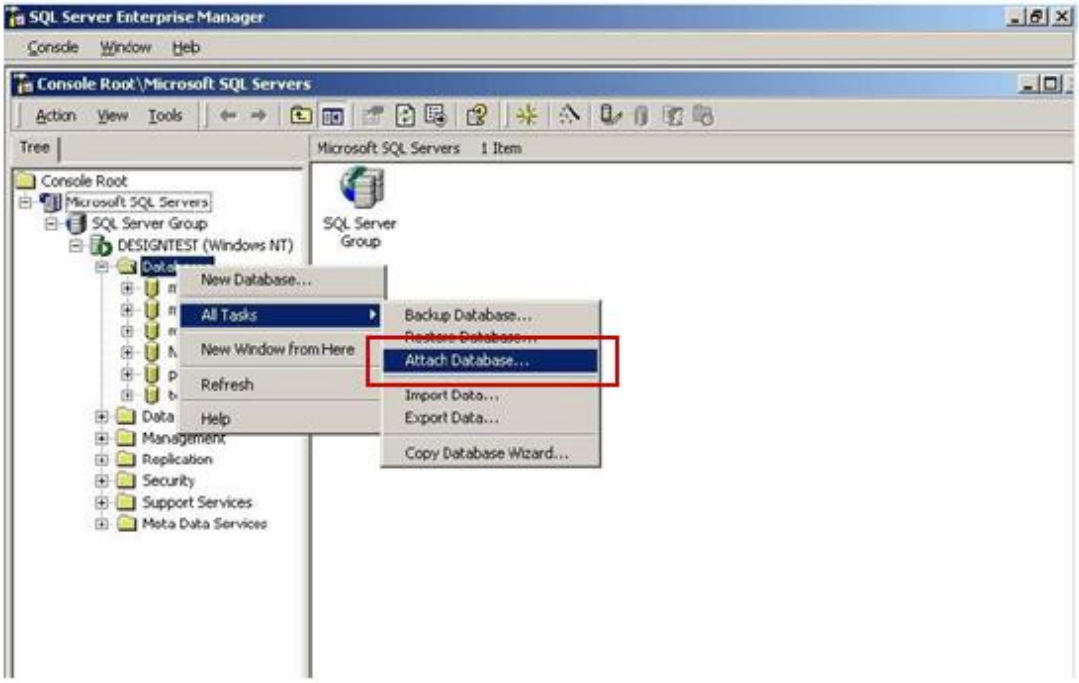


Figure 10 – SQL Server Enterprise Manager

2. Connect to the local server via **Console Root**>**SQL Server Group**>**Databases**.
3. Right-click on the **Databases** folder.
4. Select **All Tasks**.
5. Select the **Attach Database** option.
6. In the Attach Database dialog, click on the ... button.
7. In the Browse for Existing File dialog, select the ImproNet Database file **DB400.MDF**. The default path is C:\ImproNet\Database\sqlserver\DB400.MDF.
8. Click on the **OK** button. (The default log file **DB400_LOG.LDF** is automatically added to the **Attach Database** window).

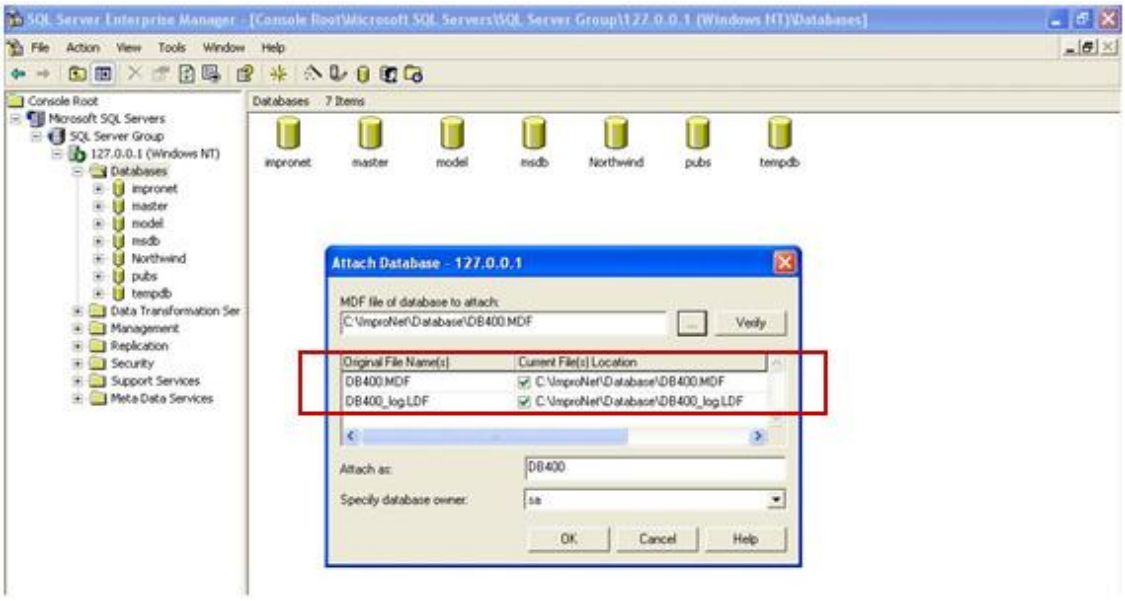


Figure 11 – Attach Database Dialog

A dialog appears confirming that the Database attached successfully.

Creating the SYSDBA User

Create a default log-in Username (**SYSDBA**) and Password (**masterkey**) as follows:

1. Open the **Security** folder.
2. Select the **Logins** option. (The right hand pane of the screen below lists the currently configured users).
3. Right-click on the right side on the **SQL Server Enterprise Manager** window.
4. Select the **New Login** option on the menu.

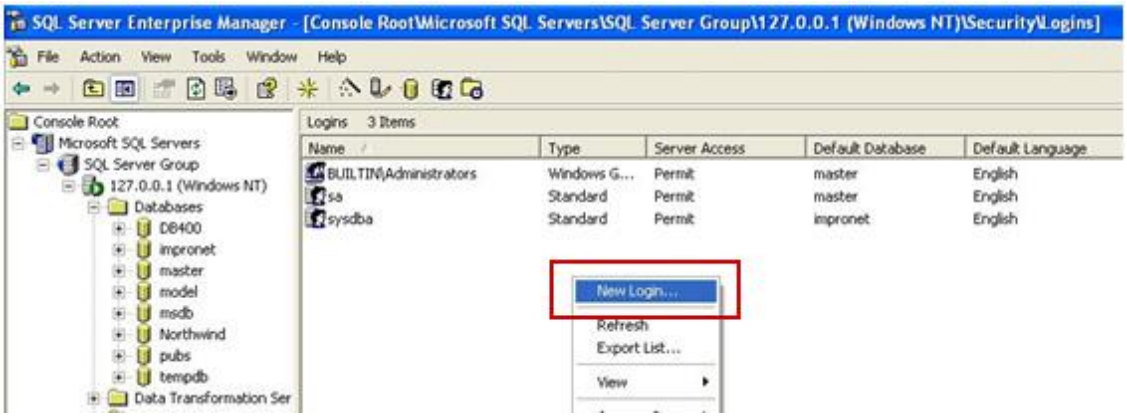


Figure 12 – Server Enterprise Manager – New Login Dialog

5. In the **SQL Server Login Properties – New Login** dialog, **General** tab assign the Users **Name**, in this instance we used **SYSDBA**.
6. Assign the Users **Password**, the default password is **masterkey**.
7. Select **DB400** from the **Database** pull-down menu.

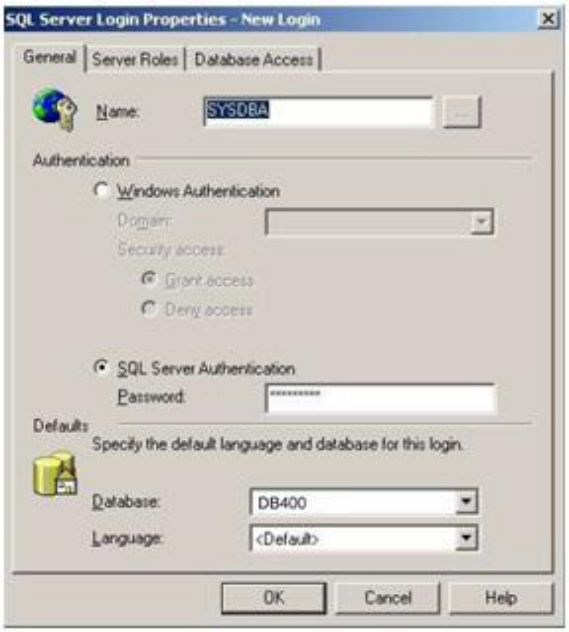


Figure 13 – In the SQL Server Login Properties – New Login Window, General Tab

8. In the **SQL Server Login Properties – New Login** dialog, **Server Roles** tab check the check-box alongside each of the **Server Roles.**

Figure 14 – SQL Server Login Properties – New Login Window, Server Roles Tab

9. In the **SQL Server Login Properties – New Login** dialog, **Database Access** tab, ensure that the **SYSDBA** user has access to the **DB400** Database.
10. Click on the **OK** button completing the step.

Connecting to the Database

Figure 15 shows an example the **Engine.properties** file when ImproNet is installed over a network.

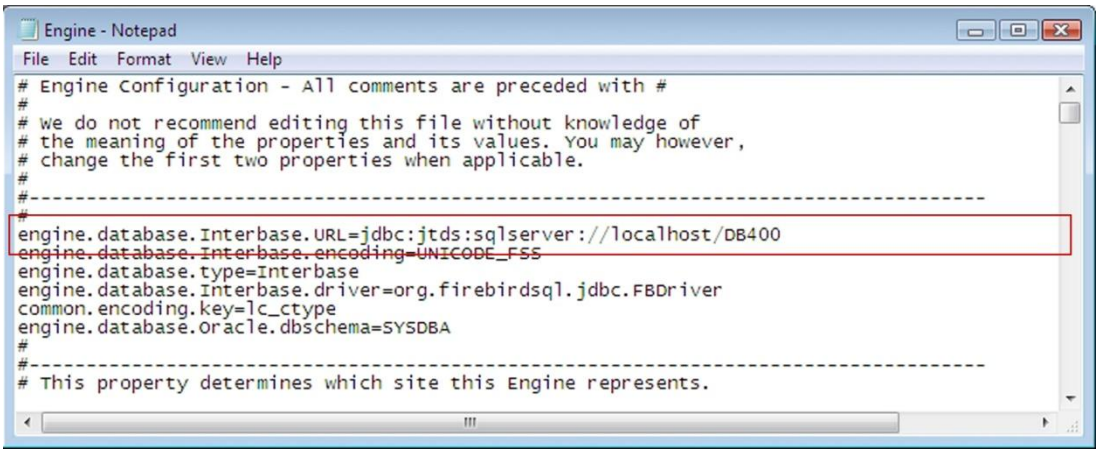


Figure 15 – Edited Engine Properties File

In a stand-alone configuration, the default computer address is always **Localhost**. In a networked environment, replace **Localhost** with the **IP Address** or **Machine Name** of the Database Server.

Configuring ImproNet for a Microsoft SQL Server 2005 (Standard Edition) Database

Installing Microsoft SQL Server 2005

1. Run **Disk 1** of the Microsoft SQL Server 2005 Software.
2. At the Start dialog, under Install, select **Server Components, Tools, Books Online and Samples**.
3. At the End User Licence Agreement dialog, select the **I Accept the Licensing Terms and Conditions** checkbox.
4. Click the **Next** button.
5. At the Installing Prerequisites dialog, click the **Install** button.
6. On successful installation of the prerequisite components, click the **Next** button.

Microsoft SQL Server Installation Wizard

1. Click the **Next** button.
2. At the System Configuration Check dialog, click the **Next** button.
3. In the Registration Information dialog, fill in the required details. These include:
   - **Name**
   - **Company**
   - **Product Key**
4. Click the **Next** button.
5. In the Components to Install dialog, select the components for installation.
6. Click the **Next** button.
7. In the Instance Name dialog, select the **Default Instance** radio button.
8. Click the **Next** button.
9. In the Service Account dialog, select the **Use a Domain User Account** radio button.
10. Complete the **Username**, **Password** and **Domain** textboxes.
11. From the Start Services at the End of Setup pane, select the **SQL Server** checkbox.
12. Select the **Analysis Services** checkbox.
13. Click the **Next** button.
14. At the Authentication Mode dialog, select the **Mixed Mode** checkbox.
15. Complete the **Enter** and **Confirm Password** textboxes.
16. Click the **Next** button.
17. At the Collation Settings dialog, click the **Next** button.
18. At the Error and Usage Report Settings dialog, click the **Next** button.
19. At the Ready to Install dialog, click the **Install** button.
20. At the prompt, insert **Disk 2** into the drive and click the **OK** button.
21. When all Products show their Status as “Setup Finished”, click the **Next** button.
22. At the Completing Microsoft SQL Server 2005 Setup dialog, click the **Finish** button.

After installation, you may want to install the latest service pack for Microsoft SQL Server 2005. Follow the on-screen prompts.

Creating a Login Account for SYSDBA

1. In Windows®, click **Start**>**Programs**>**Microsoft SQL Server 2005**>**SQL Server Management Studio**.

Figure 16 – Connect to Server Dialog

2. In the Connect to Server dialog, from the **Server Name** drop-down list, select the appropriate **Server Name**.
3. From the **Authentication** drop-down list, select the **SQL Server Authentication** option.
4. In the **Login** textbox, type in **sa**.
5. In the **Password** textbox, enter the **password** you created in the section titled Microsoft SQL Server Installation Wizard (page 28), point 15.
6. Click the **Connect** button.

Figure 17 – Microsoft SQL Server Management Studio Dialog

7. In the Object Explorer Pane, select the **Security** folder.
8. Right-click over the Security folder and select the **New** menu option.
9. Select the **Login** menu option.

Login – New Dialog

1. On the **General page**, in the Login Name textbox, type in **SYSDBA**.
2. Select the **SQL Server Authentication** radio button.
3. In the Password and Confirm Password textboxes, type in a suitable **password**.

*In this example we used the password **masterkey**.*

4. Deselect the **Enforce Password Expiration** checkbox.
5. Select the **Server Roles page**.
6. In the right-hand pane, select the checkbox alongside each of the **Server Roles**.

Ensure that the SYSDBA user has access to the DB400.MDF Database.

7. Click the **OK** button.

Configuring Microsoft SQL Server for ImproNet

Attaching the Database

1. In Windows®, click **Start**>**Programs**>**Microsoft SQL Server 2005**>**SQL Server Management Studio**.
2. In the Connect to Server dialog, from the Server Name drop-down list, select the appropriate **Server Name**.
3. In the Login textbox, type in **SYSDBA**.
4. In the Password textbox, enter the **password** you created in the section titled Login – New Dialog (page 29), point 3.
5. In the Object Explorer Pane, select the **Databases** folder.
6. Right-click over the Databases folder and select the **Attach** menu option.
7. In the Attach Databases dialog, click the **Add** button.
8. In the Locate Database Files dialog, browse to the **DB400.MDF** Database.

*The default path is **C:\ImproNet\Database\sqlserver\DB400.MDF**.*

9. Click the **OK** button.
10. In the Attach Databases dialog, click the **OK** button.

From the Object Explorer pane, if you select the Databases folder, you should see the DB400 Database in the list on the right-hand side pane.

11. From the File drop-down menu, select **Exit**.

Properties Files

1. In Windows®, click **Start**>**My Documents**.
2. Browse to **C:\ImproNet\Database\sqlserver**.
3. Select and Copy the following files:
   - **Access.properties**
   - **Biometric.properties**
   - **Engine.properties**
   - **Graphics.properties**
   - **Localization.xml**
4. Browse to **C:\ImproNet**.
5. Paste the copied files, ensuring that you replace the existing Properties files.
6. Click the button.

Configuring ImproNet for a Microsoft SQL Server 2008 R2 (Express Edition) Database

Installing Microsoft SQL Server 2008

1. Select one of the following options:
   - If running a 32-bit operating system, run the **SQLEXPRADV_x86_ENU.exe** file.
   - If running a 64-bit operating system, run the **SQLEXPRADV_x64_ENU.exe** file.
2. At the SQL Server Installation Centre dialog, from the left-hand side panel, select the **Installation** option.

Microsoft SQL Server Installation Wizard - Part 1

1. From the right-hand side panel, select the **New SQL Server Stand-alone Installation or Add Features to an Existing Installation** option.
2. At the Setup Support Rules dialog, click the **OK** button.

Ensure the indicated Rules are passed. Where the Status indicates a failure, make the necessary corrections and re-run the test.

3. If prompted to, enter your SQL Server **Product Key**.
4. Click the **Next** button.
5. At the License Terms dialog, select the **I Accept the License Terms** checkbox.
6. Click the **Next** button.
7. At the Setup Support Files dialog, click the **Install** button.
8. On successful installation of the prerequisite components, click the **Next** button.

Microsoft SQL Server Installation Wizard - Part 2

1. At the second Setup Support Rules dialog, click the **Next** button.

Ensure the indicated Rules are passed. Where the Status indicates a failure, make the necessary corrections and re-run the test.

2. Click the **Next** button.
3. At the Feature Selection dialog, click the **Select All** button.
4. Click the **Next** button.
5. At the Instance Configuration dialog, select the **Default Instance** radio button.
6. Click the **Next** button.
7. Review the Disk Usage Summary presented, ensuring that you have sufficient drive space for a successful installation.
8. Click the **Next** button.
9. In the Server Configuration dialog, click the **Use the Same Account for all SQL Server** Services button.
10. From the Account Name drop-down list, select **NT Authority\System**.
11. Click the **OK** button.
12. Review the Server Configuration summary information that displays. Refer to Figure 18 for details of the information displayed.

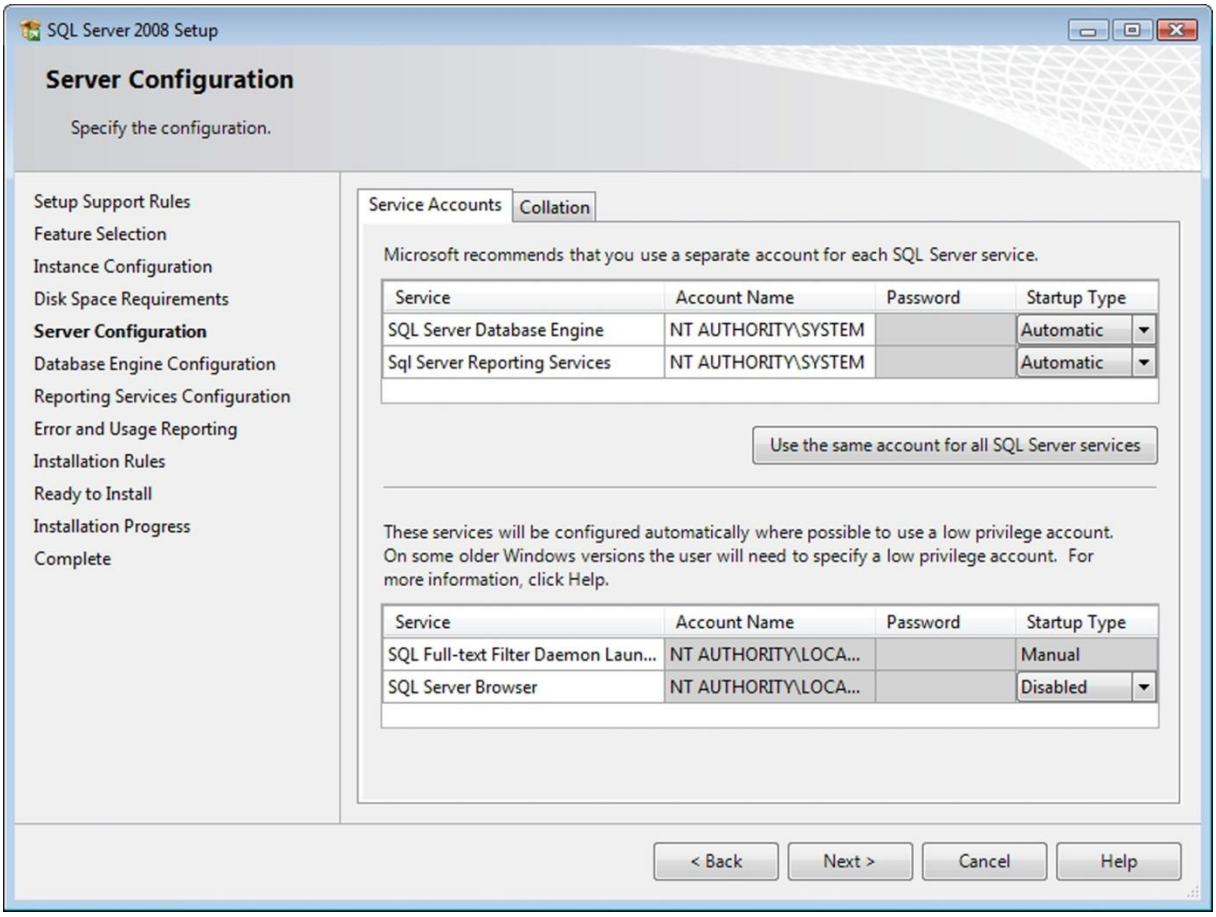


Figure 18 – Microsoft SQL Server, Server Configuration Dialog

13. Click the **Next** button.
14. On the Account Provisioning tab, within the Authentication Mode group, select the **Mixed Mode (SQL Server Authentication and Windows Authentication)** radio button.
15. In the **Enter Password** textbox, enter the password (**masterkey**).
16. In the **Confirm Password** textbox, enter the password (**masterkey**).
17. Click the **Add Current User** button.
18. Click the **Next** button.
19. Select the **Install the Native Mode Default Configuration** radio button.
20. Click the **Next** button.
21. Complete the Error and Usage Reporting dialog according to your preference.
22. Click the **Next** button.

Microsoft SQL Server Installation Wizard - Part 3

1. At the Installation Rules dialog, click the **Next** button.

Ensure the indicated Rules are passed. Where the Status indicates a failure, make the necessary corrections and re-run the test.

2. Click the **Install** button.
3. At the Computer Restart Required dialog, click the **OK** button.
4. Click the **Next** button.
5. Click the **Close** button.
6. Click the **OK** button.

After installation, you may want to install the latest service pack for Microsoft SQL Server 2008. Follow the on-screen prompts.

SQL Server Configuration Manager

1. In Windows®, click **Start**>**Programs**>**Microsoft SQL Server 2008**>**Configuration Tools**>**SQL Server Network Configuration**.
2. From the Directory Tree on the left-hand side of the dialog, expand the **SQL Server Network Configuration** tree node.
3. Select the **Protocols for SQLEXPRESS** option.
4. From the Items Panel on the right-hand side of the dialog, right-click your mouse over the **TCP/IP** option.
5. Select the **Properties** option.

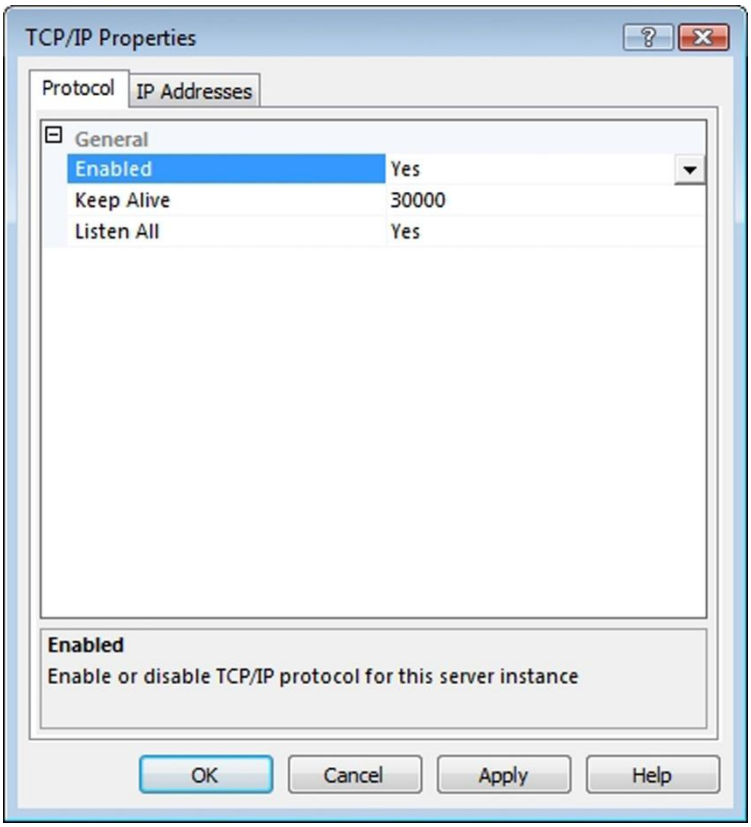


Figure 19 – TCP/IP Properties Dialog

6. Set the **Enabled** property to **Yes**.
7. Select the **IP Addresses** Tab.
8. Within the IP1 Group, set the **Enabled** property to **Yes**.
9. Set the **IP Address** property to that of your local IP Address.
10. Set the **TCP Port** property to **1433**.
11. Within the IPALL Group, set the **TCP Port** property to **1433**.

*Where you have multiple Network Interface Cards, you may have more IP Address settings for configuration. For each additional (IP2 to IP7) Group, change the settings as shown in points 8 to 10 (above). Take care to set the **TCP Port** to **1433**.*

12. Click the **Apply** button.
13. At the Warning dialog, click the **OK** button.
14. At the TCP/IP Properties dialog, click the **OK** button.
15. From the Directory Tree on the left-hand side of the dialog, select the **SQL Server Services** tree node.
16. From the Items Panel on the right-hand side of the dialog, right-click your mouse over the **SQL Server (SQLEXPRESS)** option.
17. Select the **Restart** option.

Creating the Blank Database for Attachment

1. In Microsoft® Explorer, browse to **C:\ImproNet\Database\sqlserver** (this is the path used in a default installation).
2. Copy the **DB400.MDF** and **DB400_Log.LDF** files.
3. Browse to **C:\ImproNet\Database** (this is the path used in a default installation).
4. Paste the **DB400.MDF** and **DB400_Log.LDF** files copied earlier.

Creating a Login Account for SYSDBA

1. In Windows®, click **Start**>**Programs**>**Microsoft SQL Server 2008**>**SQL Server Management Studio**.

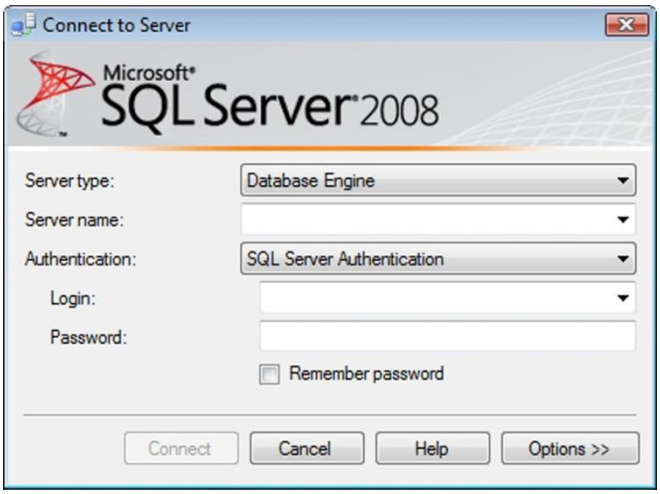


Figure 20 – Connect to Server Dialog

2. In the Connect to Server dialog, from the **Server Name** drop-down list, select the appropriate **Server Name**.
3. From the **Authentication** drop-down list, select the **SQL Server Authentication** option.
4. In the **Login** textbox, type in **sa**.
5. In the **Password** textbox, enter the **password** you created in the section titled Microsoft SQL Server Installation Wizard - Part 2 (page 31), point 15.
6. Click the **Connect** button.

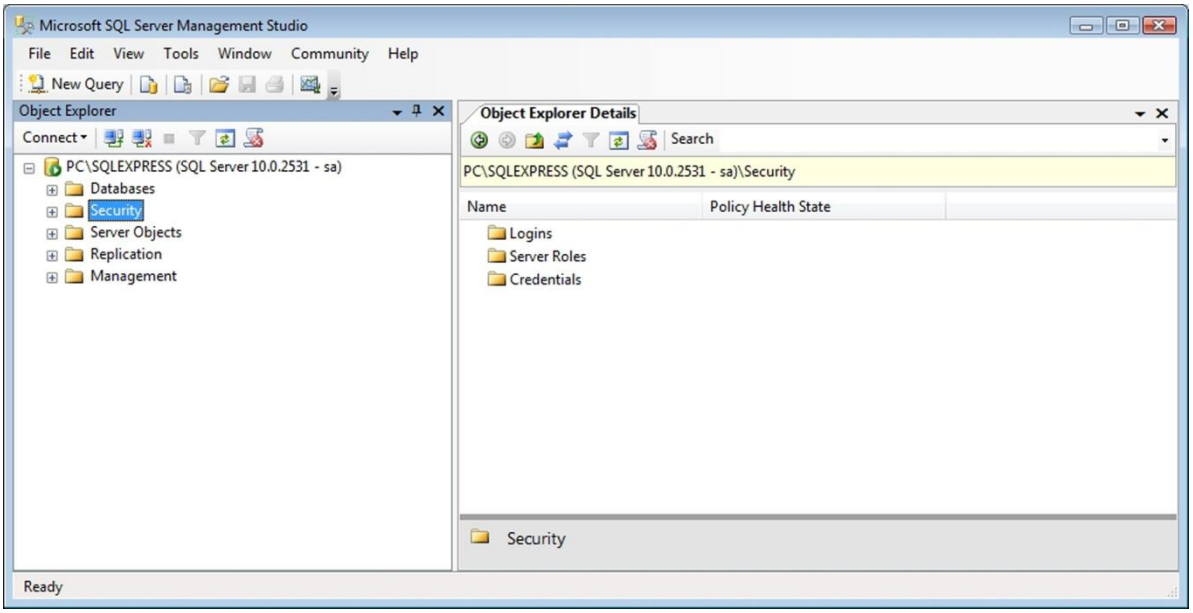


Figure 21 – Microsoft SQL Server Management Studio Dialog

7. In the Object Explorer Pane, select the **Security** folder.
8. Right-click over the Security folder and select the **New** menu option.
9. Select the **Login** menu option.

Login – New Dialog

1. From the Select a Page panel, ensure the **General** page is selected.
2. In the **Login Name** textbox, type in **SYSDBA**.
3. Select the **SQL Server Authentication** radio button.
4. In the **Password** and **Confirm Password** textboxes, type in a suitable **password**. In this example we used the password **masterkey**.
5. Deselect the **Enforce Password Expiration** checkbox.
6. From the Select a Page panel, select the **Server Roles** page.
7. In the right-hand pane, select the checkbox alongside each of the **Server Roles**.

Ensure that the SYSDBA user has access to the DB400.MDF Database.

8. Click the **OK** button.

Configuring Microsoft SQL Server for ImproNet

Attaching the Database

1. In Windows®, click **Start**>**Programs**>**Microsoft SQL Server 2008**>**SQL Server Management Studio**.
2. In the Connect to Server dialog, from the **Server Name** drop-down list, select the appropriate **Server Name**.
3. From the **Authentication** drop-down list, select the **SQL Server Authentication** option.
4. In the **Login** textbox, type in **SYSDBA**.
5. In the **Password** textbox, enter the **password** you created in the section titled Login – New Dialog (page 35), point 4.
6. Click the **Connect** button.
7. In the Object Explorer Pane, select the **Databases** folder.
8. Right-click over the Databases folder and select the **Attach** menu option.
9. In the Attach Databases dialog, click the **Add** button.
10. In the Locate Database Files dialog, browse to the **DB400.MDF** Database. The default path is **C:\ImproNet\Database\DB400.MDF**.
11. Click the **OK** button.
12. In the Attach Databases dialog, click the **OK** button.

From the Object Explorer pane, if you select the Databases folder, you should see the DB400 Database in the list on the right-hand side pane.

13. From the File drop-down menu, select **Exit**.

Properties Files

1. In Windows®, click **Start**>**Documents**.
2. Browse to **C:\ImproNet\Database\sqlserver**.
3. Select and Copy the following files:
   - **Access.properties**
   - **Biometric.properties**
   - **Engine.properties**
   - **Graphics.properties**
   - **Localization.xml**
4. Browse to **C:\ImproNet**.
5. Paste the copied files, ensuring that you replace the existing Properties files.
6. Click the button.

Configuring ImproNet Modules for a WAN

Running ImproNet across a WAN is similar to running ImproNet across a LAN. However, WANs generally have slower performance. ImproNet has options to minimize the resources required by a slower-than-usual architecture.

Advanced Engine Settings

Figure 22 shows an extract from the **Engine.properties** file. Lines beginning with a # are comments describing the settings. Edit the highlighted settings as required to compensate for the Engine running across a WAN:

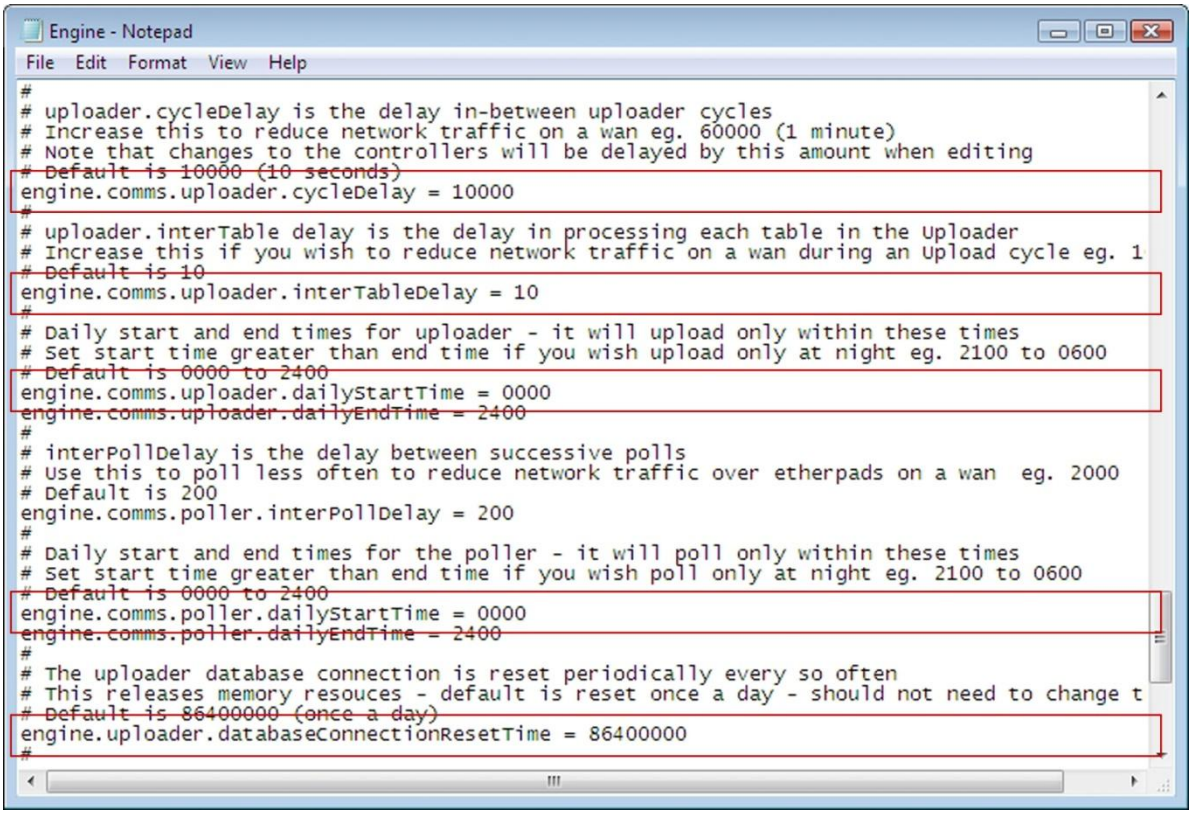


Figure 22 – Engine.properties WAN Settings

You can also edit these settings via the ImproNet Engine Software.

Figure 8 on page 22 illustrates a possible ImproNet Configuration where a second site is connected via a WAN. In this type of scenario, it is important to determine how much bandwidth is available to the Engine Server. If resources are limited, we recommend editing the advanced Engine settings to further reduce the bandwidth that Engine requires to operate efficiently.

Connecting to the Database

Refer to Figure 8 on page 22—to connect the **Engine 2** PC on **Site 2** to the **Database Server**; edit the **Engine.properties** file on Engine 2 to point to the Database Server.

Because a second Engine (Site) has been added, you must update the **Engine.properties** file on **Engine 2** to reflect Site 2. You must do this **before** you execute an Auto-ID procedure.

In this example, change the **System Site SLA** from **system.sitesla = 01000000** to **system.sitesla = 02000000**.

Using Routers Configuration

The following factors affect bandwidth when a router is used:

- Number of hardware devices configured in ImproNet Access
- Number of Tagholders

- Existing WAN load usage
- Number of ImproNet client applications that access data via a router

Router Configuration

WAN routers must enable *pass-through communication* on the port that the Database Server is using for connection. This is essential if the router has a built-in firewall.

Firebird Port

Firebird uses **Port 3050** by default. Therefore, ensure that WAN routers have **TCP/IP** enabled for network traffic sent to Port 3050.

Bandwidth Requirements

Every ImproNet installation will have different bandwidth requirements. For example, an Engine that uploads 200 Tags to a single Controller can do so through a 64 k ISDN line. However, an Engine that has to upload 5 000 Tags to five Controllers needs at least a 768 k dedicated ISDN line.

It is impossible to specify the exact requirement for a WAN. However, we recommend a *minimum* WAN connection bandwidth of **1 Mbps**. For *optimal* performance across a WAN, we advise you to consider a connection with at least **2 Mbps** of bandwidth.

Perform bandwidth-intense activities such as uploading Tag data to Controllers after-hours, thereby reducing network load during normal hours.

Refer to Part 8 – Utilities for more information on the ImproX EC and ImproX EC^{II} Controllers configuration.

System Concepts

System Architecture Concepts

An ImproNet Access Control System comprises the following elements:

- Sites
- Controllers
- Locations
- Zones

The ImproNet System Architecture is illustrated elsewhere in this Manual.

Sites

Each System consists of one or more **Sites**. Sites are independent of each other. Each Site can have only one Host. The Host is the **Engine** Module for a particular Site.

Controllers

- An IXP300 Site supports up to **16 IC Controllers**. Each Controller supports up to **48 Terminals (Fixed Addresses)**.
- An IXP400 Site supports up to **64 EC Controllers**. Each Controller supports up to **64 Terminals (Fixed Addresses)**.
- An IXP400i Site supports up to **64 EC^{II} Controllers**. Each Controller supports up to **64 Terminals (Fixed Addresses)**.

It is possible to use a mixture of IC and EC Controllers on the same Site. However, a Site using a mixture of IC and EC Controller types is limited to the parameters of the Controller with the lowest limits. For example, a Site with an IC Controller will accept a maximum of 16 Controllers and 8 000 Tags instead of the EC Controller's limit of 160 000 Tags.

Location

A location is a physical access control point. It comprises a group of **Terminals** servicing an access control point such as a Door. A Location supports up to three Terminals for the following functions.

- Door Entry
- Door Exit
- Door Relay Control

Zones

A **Zone** is a group of Locations (access control points). Entry and exit to and from a Zone is achievable via its Locations only. Generally, a Zone is a physically bounded area containing one or more locations. A Zone can also contain other Zones within it. This enables an Operator to configure settings such as Anti-Passback settings. These Zones are referred to as *Nested Zones*.

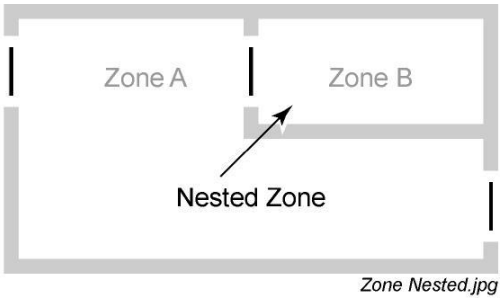


Figure 23 – Nested Zone

Zone Grouping is when one Zone is linked to another Zone to form a *Common Zone*. This enables Tagholders to enter via a Location in one Zone and exit via a Location in another Zone.

Adjacent Zoning is a form of Zone grouping. It is when two neighbouring Zones use a single Location to go from the one Zone to the other Zone.

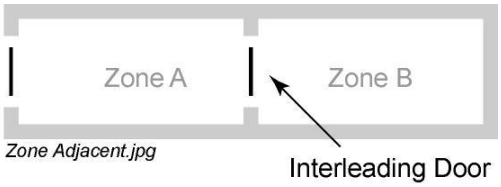


Figure 24 – Adjacent Zoning

System Building Blocks

ImproNet Software Suite

The ImproNet Software Suite is designed to run on Microsoft Windows® 2000, XP and Vista (Business or Ultimate). These limitations are important for the efficiency and reliability of the System.

Supervisory Elements—Host PC

Each Site requires a Host PC for control and supervision of the Site. Alternatively, multiple PC's can be used for the same function.

*In this manual, the term **Host PC** refers to the computers that perform control and supervisory functions, regardless of the number of PC's used.*

On a typical Site, the following functions are performed by the Host PC:

- **Database Server**—dedicated to the Site Database.

- **Site Engine**—dedicated to processing communications between the Database Server and the Controllers. It also performs a polling function from the Server to the Controllers.
- **Client Workstation**—dedicated to supervisory aspects. These include entering and deleting data, viewing Graphics Runtime and Alarms, preparing Transaction reports, and running Utilities. Note that some monitoring installations may need a dedicated PC to run Graphics Runtime.
- **CCTV**—required when Cameras are installed as part of the monitoring system.

Additional, dedicated CCTV PC's may be required depending on the number of cameras.

*The CCTV **DVR Server** must be a dedicated PC.*

System Buses

There are two system buses in an ImproNet Access Control System:

- **The Host Bus**—the RS232 or RS485 bus that links the Host PC via the Host Interface Unit (ImproX HI or ImproX RH), to the Controllers. EC and EC^{II} Controllers can operate on a LAN communications infrastructure. Each Site in a System requires its own Host Bus.
- **The Terminal Bus**—the RS485 bus that connects each Controller to its Terminals. There is one Terminal Bus per Controller.

Serial Peripheral Ports

Some hardware units have an RS232 Serial Peripheral Port. They can be connected to a single peripheral device.

Host Interface Unit

The Host Interface unit converts RS232 to RS485. It serves as an interface between the Host PC and the Controllers.

RH Interface Unit

The RH is the USB equivalent of the Host Interface unit. It converts RS485 to USB. It serves as an interface between a USB enabled Host PC and the Controllers.

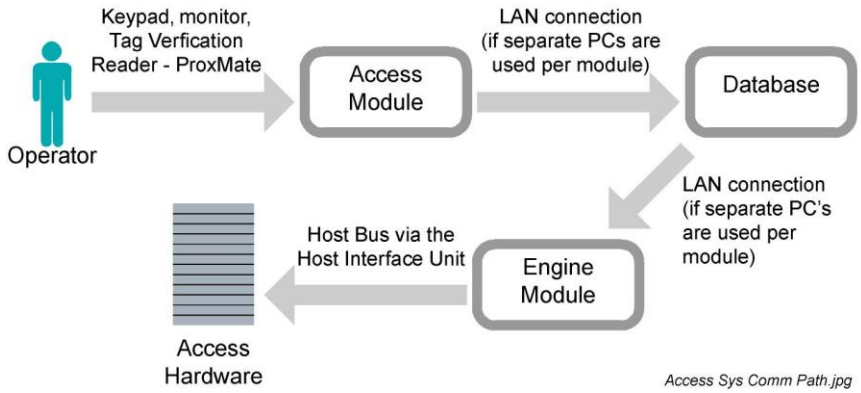


Figure 25 – Access System Communications Paths

Software Installation Procedure

ImproNet no longer supports Windows® 95, 98, or NT. ImproNet will, however, support Windows® Server platforms (Windows® 2000 Advanced Server and Windows® 2003 Server) only when used with a Microsoft SQL Server Database.

*Validated Linux Support exists for ImproNet **Engine**, **Access** and the **Database**. The validated Linux Operating Systems include: Fedora Core 7, Debian 4.0 and OpenSuSE10.*

Log on to Windows® with Administrator privileges to install ImproNet.

New ImproNet Installation

The ImproNet Software Suite is supplied on an installation **CD-ROM**. Before you install it, ensure you have read the following:

PC Hardware Requirements

Refer to the section Minimum PC Specifications on page 5.

TCP/IP Network

Do not install any software until the TCP/IP protocol is installed, and the machine is assigned an IP Address.

TCP/IP is required for single and multiple Host PC scenarios to provide IP Addresses. For a single Host PC without a Network Interface Card (NIC) install a Virtual Network Adapter such as the *Microsoft Loopback* Adapter or the *Microsoft Virtual Private Networking (VPN)* Adapter. These are virtual software adapters only; no additional hardware is required. Install the TCP/IP protocol using the Windows® Control Panel.

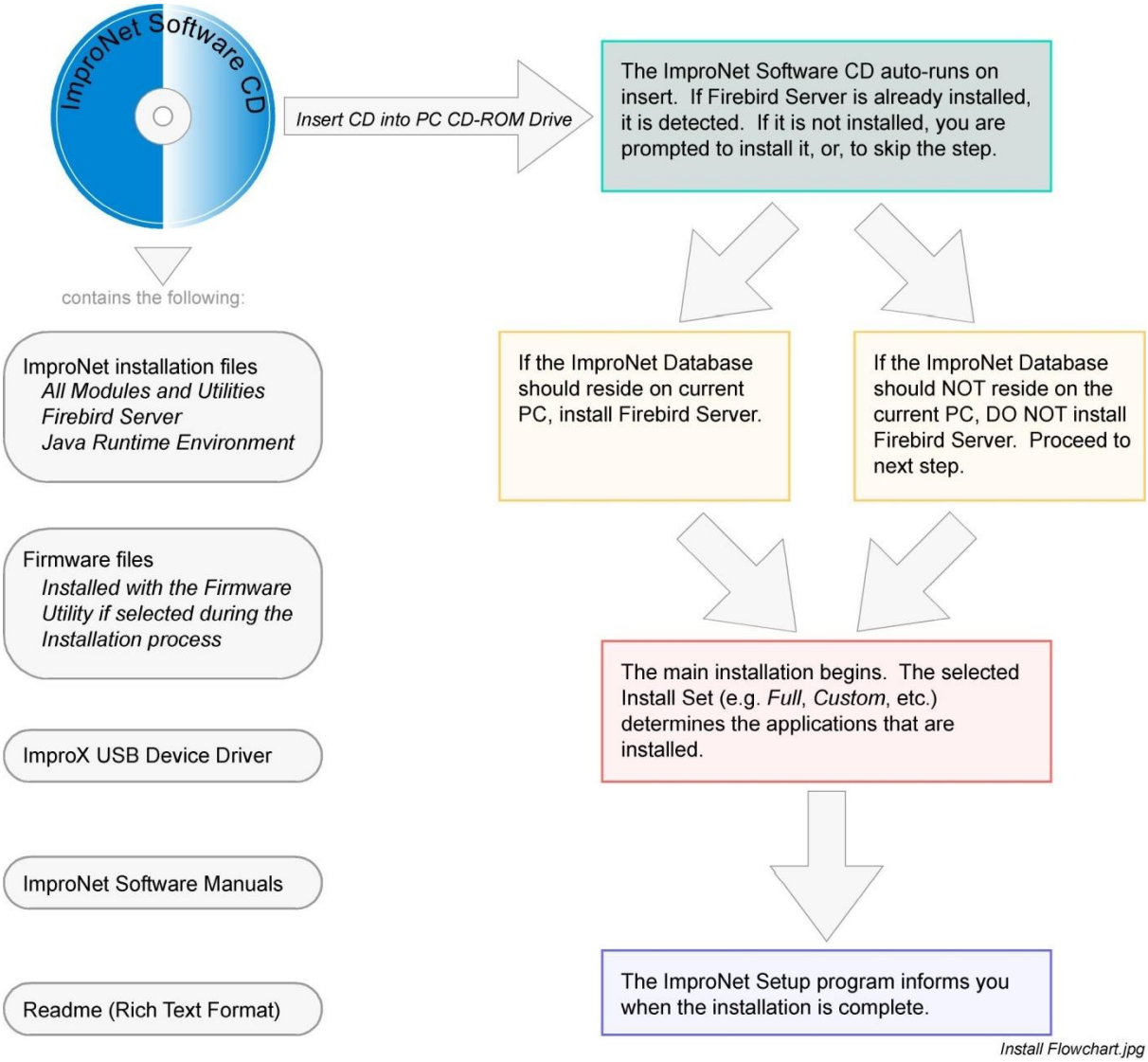


Figure 26 – ImproNet Software Installation Flowchart

Installation Sequence

*Read the **Release Notes** on the Installation CD. The following items are specifically mentioned: Removal of InterBase V6; Default Username and Password; Database Update, Coding and Error Settings; Windows® XP Restore Feature; Controller and Firmware Versions and New Software Features.*

*If you have an earlier version of **InterBase**, **InterServer**, or **InterClient** installed on the PC, you **MUST uninstall** them before running the Software Installation Wizard. New versions of these software programs are installed. If the Installation program detects an earlier version, you are prompted to remove the earlier version and start again.*

The ImproNet Installation CD uses an automated, interactive Installation **Wizard** to guide you through the installation process. The Wizard prompts you at various stages to select installation options. This makes it possible to customize the ImproNet Software Suite.

Install the ImproNet Software in the following sequence:

1. **Database Sever**—this is ESSENTIAL. Refer to the section, Installing the Database Server.
2. **Applications**—Modules and Utilities.
3. **Database**—Installed with the Engine Module.
4. **USB Driver**—Only if USB Enrollment Readers or Converters are used.

Installing the Database Server

A Database Server is required to host the ImproNet Database. If the ImproNet Suite is installed on to a single PC, the Database Server is installed automatically. However, if more than one PC is used to host the ImproNet Software, you must install the Database Server manually.

You need not install Firebird if you are using SQL Server.

Firebird automatically prompts to install, if a previous version is not detected.

Any PC on the network can host the Database Server. ImproNet uses **Firebird 1.5** as its Database Server. To install Firebird 1.5 manually, proceed as follows:

Installing Firebird

1. Select a PC to host the Database Server.
2. Insert the ImproNet Installation CD in the PC's CD-ROM drive.
3. Browse to the **\database\firebird** directory on the ImproNet Installation CD.
4. Double-click **Firebird.exe**.
5. In the Select Language Setup dialog, from the drop-down menu, select your preferred **language**.
6. Click the **OK** button.

Firebird Installation Wizard

1. At the Welcome dialog, review and follow the on-screen instructions.
2. Click the **Next** button.
3. At the Licence Agreement dialog, select the **I Accept the Agreement** radio button.
4. Click the **Next** button.
5. Review the Information dialog, and then click the **Next** button.
6. In the Select Destination Location dialog, select the **Destination Directory**—we recommend that you use the default location of **C:\Program Files\Firebird\Firebird_1_5**.
7. Click the **Next** button.

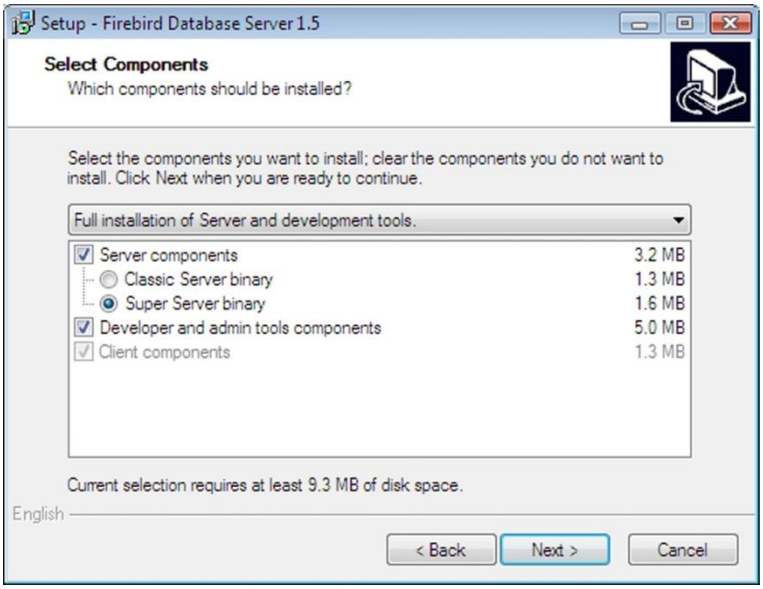


Figure 27 – Firebird Select Components

8. From the drop-down menu, select the **Full Installation of Super Server and Development Tools** option.
9. At the Select Start Menu Folder screen click **Next**.

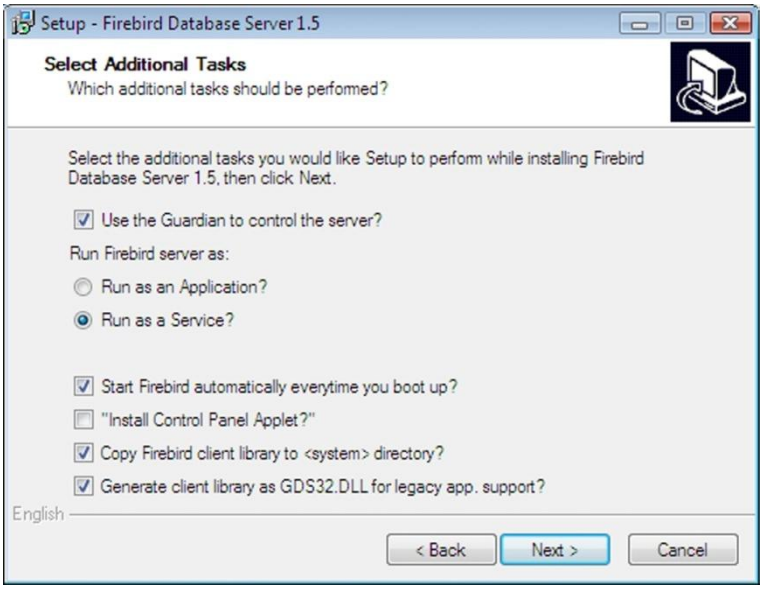


Figure 28 – Firebird Select Additional Tasks

In Vista installations, ensure that you de-select the "Install Control Panel Applet?" option.

10. On the Select Additional Tasks screen:
    - Select the **Use the Guardian to Control the Server?** option.
    - Select **Run as a Service?** option.
    - Select the **Start Firebird Automatically Everytime You Boot Up?** option.
    - Select the **Copy Firebird Client Library to <System> Directory?** option.
    - Select the **Generate Client Library as GDS32.DLL for Legacy app. Support?** option.

11. Click the **Next** button.
12. Click the **Install** button.
13. Review the Information dialog and then click the **Next** button.
14. Click the **Finish** button.

ImproNet Installation Procedure

To install the ImproNet Software Suite on a single Host PC proceed as follows:

1. Insert the ImproNet Installation CD into the CD-ROM drive.
2. Select the **Install ImproNet Suite** option.

If the CD does not start up automatically, browse the CD in Windows® Explorer and double-click Setup.exe.

3. Select **English** as the language option.
4. Click the **OK** button.

If no Database Server is present, one is installed. Follow the onscreen instructions for this.

5. At the Introduction screen, click **Next**.
6. At the Licence Agreement screen, select the **I Accept the Terms of the Licence Agreement** radio button.
7. Click the **Next** button.
8. At the Choose Install Folder screen, click **Next**.

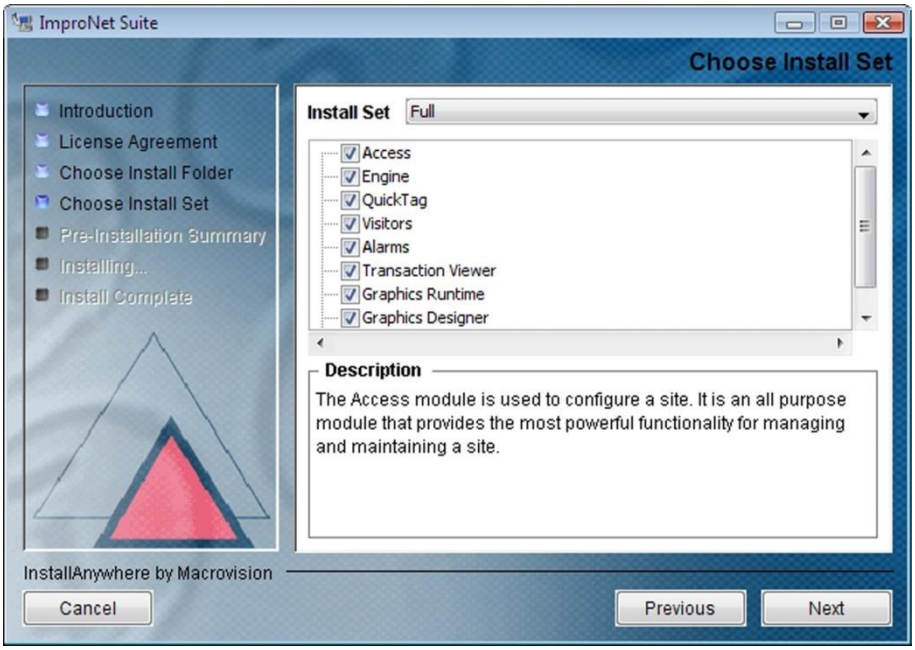


Figure 29 – Install Set Menu

9. At the Choose Install Set screen, from the **Install Set** drop-down list, make your preferred installation type selection.

An Install Set is a collection of pre-selected applications suitable for specific scenarios.

Customize an Install Set option by selecting or de-selecting applications from the list.

10. Click the **Next** button.
11. Click the **Install** button.
12. At the Install Complete dialog, click the **Done** button.

Installing the Access or Engine Modules Only

This Section describes the installation procedure for the Access and Engine Modules and the Database Server only.

Installing ImproNet Access Only

To Install the Access Module only, proceed as follows:

1. Insert the ImproNet Installation CD into the CD-ROM drive. If the CD does not start up automatically, browse the CD in Windows® Explorer and double-click **Setup**.
2. The **Install Anywhere** screen displays and files are extracted.
3. Select **English** as the language option.
4. Click **OK**.

If a Database Server is present, it is detected. If no Database Server is present, one is installed. Follow the onscreen instructions for this.

5. Click **Next**. The License Agreement screen displays.
6. Select the **I Accept the Terms of the Licence Agreement** option.
7. Click **Next**. The **Choose Install Folder** screen displays.
8. Click **Next**.
9. Select the **Custom** option from the **Install Set** menu.
10. Select the **Access** checkbox from the list.
11. Clear all other checkboxes.
12. Click **Next**.

Installing ImproNet Engine Only

To Install the Engine Module only, proceed as follows:

1. Insert the ImproNet Installation CD into the CD-ROM drive. If the CD does not start up automatically, browse to the CD in Windows® Explorer and double-click **Setup.exe**.
2. The **Install Anywhere** screen displays and files are extracted.
3. Select **English** as the language option.
4. Click **OK**.

If a Database Server is present, it is detected. If no Database Server is present, one is installed. Follow the onscreen instructions for this.

5. Click **Next**. The License Agreement screen displays.
6. Select the **I Accept the Terms of the Licence Agreement** option.
7. Click **Next**. The **Choose Install Folder** screen displays.
8. Click **Next**.
9. Select the **Custom** option from the **Install Set** menu.
10. Select the **Engine** checkbox from the list.
11. Clear all other checkboxes.
12. Click **Next**.
13. Click **Install**.

*During the Engine Module installation, a blank Database is created in **C:\ImproNet\Database**.*

*The Installation Wizard prompts you to install **Firebird** database if there is no Database Server on the PC. If the Database Server is installed on another PC, cancel the Database install set-up.*

Next, proceed as follows:

1. Connect the ImproX hardware via the Host Interface to the RS232 Serial Port on the **Engine PC**.
2. If the Database is not installed to **C:\ImproNet\Database** on the Engine PC, set the **Database Connection URL** to the location of the Database. For further information on Engine Properties configuration, refer to the Properties Files section on page 23.

Database Encoding

The default database uses **UNICODE-FSS** encoding. **ISO 8859_1** (Western Europe) and **WIN1250** (Eastern Europe) are provided for archiving support and for installations that need ImproNet Pump.

Install USB Driver for USB Registration Reader Interface

ImproNet uses a USB Registration Reader Interface to read Tags. Some Interface versions also provide an RS485 communication link to the Controllers.

The ImproNet Installation CD includes a USB driver for the USB Registration Reader Interface. You can find the USB driver in the following locations:

- USB_Device_Driver directory on the CD
- The **ImproNet** folder on the Host PC

To install the driver, proceed as follows:

*If there are old USB Drivers on the PC, delete them **before** installing the provided driver.*

1. Plug the **USB Registration Interface** into a USB port on the PC. The **Found New Hardware Wizard** displays.

2. Follow the onscreen instructions. In some cases, two drivers install; one for the **USB Registration Reader** and one for the **COM port to USB Bridge**. Therefore, the Wizard pops up twice.

In **Windows® XP**, proceed as follows:

1. The second time the wizard pops up, select **Install From a List or Specified Location**.
2. Click **Next**.
3. Select **Search for Best Driver in these Locations** and select **Include this Location**.

*The Location specified should be **USB_Device_Driver/V5.4.24** and select the appropriate folder for your operating system.*

4. Click **Next**. Ignore any *warning* dialog screen, if displayed.
5. Click **Finish.**

*On some PC's, the **New Hardware Found** wizard is displayed every time a **USB Registration Reader Interface** with a new USB Serial Number (Fixed Address) is plugged in. If this happens, choose the option to automatically install the unit. The **New Hardware Found** wizard will not display again.*

Upgrading an Existing Installation

1. Backup the existing ImproNet Database to folder for safekeeping.
2. Copy all the **Properties** files and **Localization.xml** file, if ImproNet is running on a LAN or WAN, to the safekeeping folder.
3. Make a backup copy of the **Security.fdb** file outside of the ImproNet folder. In a default installation you will find the Security.fdb file at **C:\Program Files\Firebird\Firebird 1.5\security.fdb**.
4. Uninstall the existing ImproNet Modules.
5. Install the *NEW* ImproNet Modules.
6. Ensure that the Database Server is **Firebird 1.5** or higher (but less than 2.0). If not, uninstall the existing version and replace it with the newer version.
7. Move the backup **Security.fdb** file to the *NEW* Firebird installation folder.
8. Upgrade the ImproNet Database if necessary.
9. Perform a Pump on the ImproNet Database.
10. Upgrade the Controller and Terminal Firmware if necessary.

*Ensure that you configure your ImproX EC and ImproX EC^{II} Controllers correctly **before** proceeding further with your ImproNet installation. Refer to Part 8 – Utilities for configuration information.*

Pre-configuration Procedure

When all ImproNet Software components are installed, you need to perform the **Pre-configuration Procedure**. This procedure determines if the hardware communication infrastructure is functioning correctly.

*ImproNet hardware operates on a two-tier communications architecture comprising of **Host Communications** (Connects to ImproX Controllers and the Host Interface, or ImproX RH) and **Terminal Communications** (Connects to ImproX Terminals). It is critical that there are no communication problems prior to Software configuration. Otherwise, the System will not function.*

When the ImproX hardware is physically connected and powered, perform the following steps to determine if the hardware is communicating correctly:

*Ensure that the Engine has a working connection to the ImproNet Database. Configure this connection in the **Engine.properties** file. For more information, refer to page 23 for a single PC, page 24 for a LAN, or page 28 for a WAN.*

Hardware Auto-ID

You may perform an **Auto-ID** at any time. During an Auto-ID, the Engine polls attached Controllers and Terminals, identifying their **type**, and their **Logical Address**. Run an Auto-ID as follows:

*Ensure that you **STOP** Engine before executing the Auto-ID.*

Hardware detected for the first time receives a Logical Address. Once allocated a Logical Address does not change. This ensures continuity in the ImproNet Database.

*See **Part 1 – Hardware**, **Installation Information (Fixed Addresses)** for extra information on Fixed Address arrangement when using the ImproX iTT (Antenna Ports 1 and 2).*

1. In Windows®, click **Start**>**Programs**>**ImproNet**>**Engine**.
2. On sites running ImproX ECII Controllers connected by Ethernet, continue as follows:
   a. Select **Configuration**>**Import Devices**.
   b. Alongside the **File** textbox, click the ... button.
   c. Select the **Discovery.txt** file.
   d. Click the **Open** button.
   e. Click the ✓ button.
   f. At the **Import Devices** confirmation dialog, click the **Yes** button.
3. Start the Auto-ID process by clicking the Auto ID button.

Hardware Ping Test

We recommend that a list of each Terminal and its physical location be updated during the hardware installation process. This ensures an efficient software configuration process.

After performing an Auto-ID, use the **ImproNet Firmware Upgrade** Utility to ping the hardware. The **Ping Test** requests ImproX Controllers and Terminals transmit their **Fixed Address**, **Product ID** and **Logical Address**.

Open the Firmware Upgrade Utility as follows: In Windows®, **click Start**>**Program Files**> **ImproNet**>**Utils**>**Firmware Upgrade**. See **Part 8 – Utilities, Firmware Upgrade Utility** for more information.

Ensure that the communication infrastructure is working correctly before configuring ImproNet.

USER NOTES

USER NOTES