

Atomic Time Manager 400 Product Documentation

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1. Introduction

Thank you for purchasing or evaluating **Atomic Time Manager 400**, (ATM-400), our premier product for taking care of all of your time management and synchronization needs on your iSeries or AS/400 machine. ATM-400 has a rich feature set for keeping the software and hardware clocks on your iSeries synchronized with other machines on your network. The ATM-400 product grew out of the needs of customers of Client Server Development, Inc and Davis Software Services, Inc. As we consulted with our customers on various EDI and Web Services projects, we saw a need for synchronizing the customer's iSeries with the Atomic clocks in order to provide a proper audit trail of transmission activities. We searched for a product to do this, and finding none available set about to produce a product to keep the iSeries synchronized with the world. This is the fruit of that effort and we hope that you find it useful. We continue to add features to the product, so be sure to check www.SQLThing.com for information and updates.

What is ATM-400

ATM-400 is a complete solution to clock management and synchronization for your iSeries or AS/400 computer. ATM-400 will keep your AS400's time accurate. ATM-400 can synchronize the time on your AS400 with the time server of your choice at a regular interval so it is always correct. ATM-400 can automatically adjust for Daylight Savings Time so you don't have to be up at 2am on the last Sunday of October.

How does ATM-400 Work?

ATM-400 is an RPG program that resides on your iSeries. Once installed, all you have to do is configure the program and ATM-400 handles the job of synchronizing your iSeries with the time server of your choice and can, optionally, automatically adjust for daylight savings time.

ATM-400 Requirements

- OS/400 V4R4 or above
- TCP/IP connection to the Internet or time server hardware

2. Important Information

This section contains important information that you should understand about how the ATM-400 program functions and the effects it can have on your system. The program will change or adjust the following system values:

QUTCOFFSET
QTIME
QDATE

It is important you realize the program is going to possibly modify the QUTCOFFSET system value. This value is used by OS/400 to determine the time zone where your iSeries is located. This value is also used by the ATM-400 program when checking and adjusting your QTIME and QDATE values. Many iSeries and AS/400 shops never set the QUTCOFFSET value, so it is important that you realize what this value is and how changing it may affect your system. This should not affect any of your existing software, and it is recommended that you set this value correctly. The QUTCOFFSET represent the number of hours difference between your local time and Greenwich Mean Time. All NTP time servers report their time as GMT. The ATM-400 program will use the QUTCOFFSET value to determine the difference between your local time and the target time server.

Daylight Savings Time

When ATM-400 adjusts your clocks for daylight savings time, it also adjusts the QUTCOFFSET value up or down, (depending on the time of year), to reflect the new offset in effect for daylight savings time. During configuration, you can choose to have ATM-400 adjust for daylight savings time, or you can disable this feature if you do not want the product to automatically adjust.

Demo Mode

ATM-400 runs as a service program. After setup, ATM-400 places job a job into your job scheduler to ensure that the service program is running each day. When the service program activates, ATM-400 looks for your license key which is keyed to the serial number of your iSeries. If the license key is not valid or is not found, ATM-400 will operate in demo mode. Demo mode causes ATM-400 to check the differences in your clocks, but not apply the adjustments. Instead, adjustments are sent as messages to the system operator message queue. To get ATM-400 out of demo mode, restore you license key as outlined in the section of this document titled *Installing your license key*.

3. Installation

The following section details the steps involved to install ATM-400.

Restoring the Save File

ATM-400 is delivered as an iSeries Save File and can be restored to any target library you desire. The default library for ATM-400 is ATOMIC400 and will be mentioned in all commands and references as the library, but you can replace this value with any library you choose to use.

If you received the save file as an email attachment, create a temporary folder on your Windows computer and save the attached file to this folder. If you received ATM-400 on CD, simply place the CD into your CD Drive on the Windows computer.

Next, log into the target AS/400 and create a library to hold the ATM-400 program. It is recommended that you call the library ATOMIC400. Once the library is created, create a save file in the library with the CRTSAVF command. Name the save file ATOMICSAVF.

Next, start a command prompt in Windows, (Start menu, Run then type CMD and press Enter), and navigate to the directory where you saved the attachment, or to your CD Rom drive depending upon how you received the program. Once you are in the directory containing the save file you should start an FTP connection to your AS/400 system. For example: FTP MyIseries would start an FTP session with a computer called MyIseries. FTP 192.168.0.10 would start a connection with the computer at the specified address. The FTP program will probably prompt for a user ID and password, use a user profile that has authority to send objects to your iSeries.

Once you have an FTP prompt, type in BINARY and press enter. This command tells the iSeries that we will be sending a binary data file. Next, type CD ATOMIC400 to change to the ATOMIC400 library on your iSeries. Finally, type PUT ATOMICSAVF.SAVF to send the save file to your iSeries. You may now log out of FTP using the BYE command and close the command prompt window.

Log into your AS/400 using terminal emulation software and restore the ATOMICSAVF save file using the RSTOBJ command. The command syntax should look like this:

```
RSTOBJ OBJ(*ALL) SAVLIB(ATOMIC400) DEV(*SAVF)  
SAVF(ATOMIC400/ATOMICSAVF)
```

You are now ready to use the ATM-400 program!

Installing your license key

If you purchased ATM-400, a license file will be attached to your electronic order as an AS/400 save file. This save file is called ATOMICKEY.SAVF. To change your program from demo mode to licensed mode, perform the following actions.

The key file was saved in a library called ATOMICKEY on our iSeries, so the easiest thing to do is to create a library called ATOMICKEY on your iSeries.

Create save file named ATOMICKEY in ATOMICKEY library, (CRTSAVF ATOMICKEY).

Save the ATOMICKEY.SAVF file in the email attachment to a directory on your PC.

Start a command prompt in Windows, (Start menu, Run then type CMD and press Enter), and navigate to the directory where you saved the attachment, or to your CD Rom drive depending upon how you received the program. Once you are in the directory containing the save file you should start an FTP connection to your AS/400 system. For example: FTP MyIseries would start an FTP session with a computer called MyIseries. FTP 192.168.0.10 would start a connection with the computer at the specified address. The FTP program will probably prompt for a user ID and password, use a user profile that has authority to send objects to your iSeries.

Once you have an FTP prompt, type in BINARY and press enter. This command tells the iSeries that we will be sending a binary data file. Next, type CD ATOMICKEY to change to the ATOMICKEY library on your iSeries. Finally, type PUT ATOMICKEY.SAVF to send the save file to your iSeries. You may now log out of FTP using the BYE command and close the command prompt window.

Log into a terminal emulator session and restore the Key files to the ATOMICKEY library using the following command:

```
RSTOBJ OBJ(*ALL) SAVLIB(ATOMICKEY) DEV(*SAVF) SAVF(ATOMICKEY/ATOMICKEY)
```

Copy the file TU1000P in the ATOMICKEY library to the ATOMIC400 production library using *REPLACE. Example:

```
CPYF FROMFILE(ATOMICKEY/TU1000P) TOFILE(ATOMIC400/TU1000P)  
MBROPT(*REPLACE)
```

You can then get rid of the ATOMICKEY library.

Starting up the program

To start up ATM-400, start a terminal emulation session and log into your iSeries. Add the ATOMIC400 library to your library list, (ADDLIB command), and type CALL PIBTZSET or use the command ATM400. You should see a screen like the one shown in Figure 44-1. Use the information in the *ATM-400 Reference* section and the *Deployment Scenarios* section to determine how you should set the ATM-400 options.

4. ATM-400 Reference

This section of the documentation is a reference for each screen and capability of ATM-400.

Standard Time Zone Screen

The Standard Time Zone screen is shown in Figure 44-1 and is accessed by starting the PIBTZSET program.

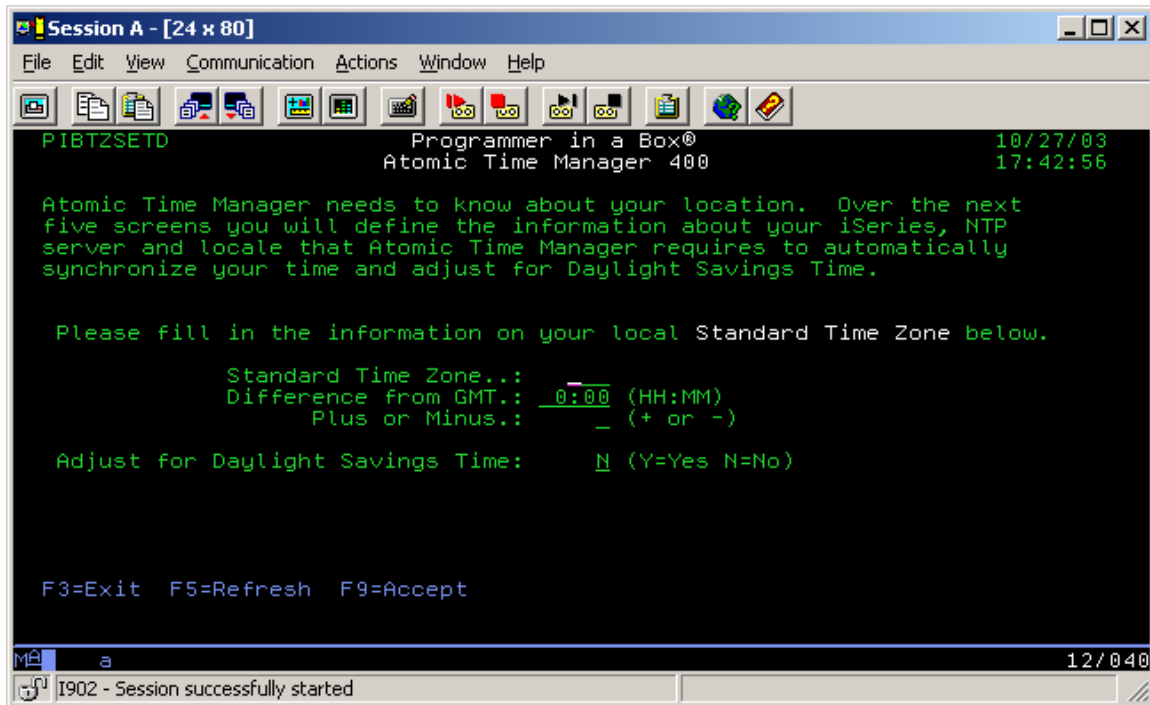


Figure 4-1, this screen allows you to enter information about your time zone.

Standard Time Zone

This field contains the three character code assigned to the time zone. (i.e. EST for Eastern Standard Time). This field is not used at this time, it is for informational purposes only. If you know your time zone code, you can enter it here; otherwise leave this field blank.

Difference From GMT

This field contains the number of hours and minutes difference between local standard time and Greenwich Mean Time. This value will be stored in the QUCTOFFSET system value.

Plus or Minus

This field contains the value '+' or '-' which indicates whether the local standard time is less than or greater than Greenwich Mean Time.

Adjust for Daylight Savings Time

Make this value a “Y” if you want the ATM-400 to automatically adjust your system values for Daylight Savings Time. Make this value “N” if you do not want ATM-400 to automatically adjust your system values for Daylight Savings Time.

Daylight Savings Time Screen

The Daylight Savings Time screen is accessed if you choose to have ATM-400 automatically adjust for daylight savings time. The screen, shown in Figure 44-2, allows you to control when daylight savings time occurs and how it should be handled.

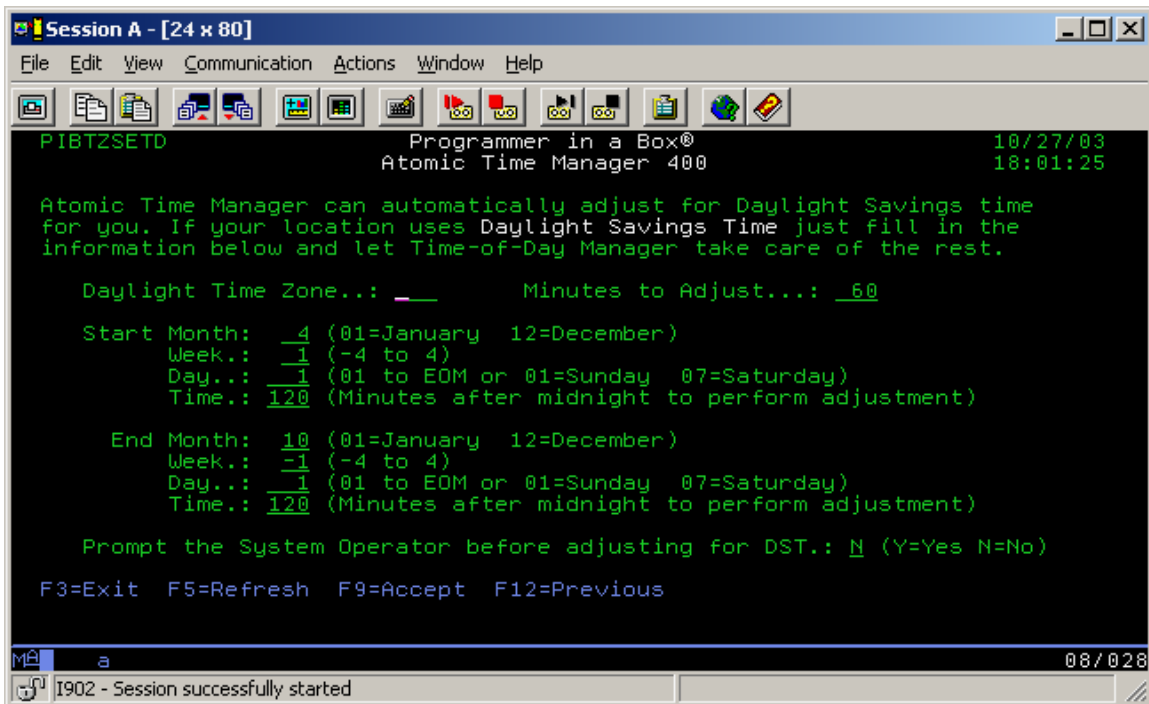


Figure 4-2. ATM-400 screen for setting Daylight Savings Time adjustments.

Daylight Time Zone

The three character code assigned to the time zone. (i.e. EDT for Eastern Daylight Time). This field is for informational purposes only and is not used in any calculation. If you do not know the daylight time zone abbreviation, do not enter anything in this field.

Minutes to Adjust

The number of minutes difference between local standard and local daylight savings time. Normally this is 60 minutes or one hour.

Start Month

The month of the year that daylight savings time goes into effect. Valid values are 01 through 12 where 01 means January and 12 means December.

Week

The week of the month when Daylight Savings Time should be activated. This value ranges from -4 to 4, with -4 corresponding to the fourth week of the month counting from the end of the month and 4 corresponding to the fourth week of the month counting from the beginning of the month.

Day

The day of the month when DST goes into effect or if the week keyword is not 0 (zero), then this is the day of the week when DST takes effect. This value ranges from 1 to the last day of the month or 1 to the last day of the week.

Time

The number of minutes after 12 midnight, local standard time, when DST goes into effect. This value ranges from 0 to 999.

End Month

The month of the year that daylight savings time ends. Valid values are 01 through 12 where 01 means January and 12 means December.

Week

The week of the month when DST ends. This value ranges from -4 to 4, with -4 corresponding to the fourth week of the month counting from the end of the month and 4 corresponding to the fourth week of the month counting from the beginning of the month.

Day

The day of the month when DST ends or if the week keyword is not 0 (zero), then this is the day of the week when DST ends. This value ranges from 1 to the last day of the month or 1 to the last day of the week.

Time

The number of minutes after 12 midnight, local standard time, when DST ends. This value ranges from 0 to 999.

Prompt the System Operator before adjusting for DST

Make this value a “Y” if you want Atomic Time Manager 400 to inform the user/system operator that it is about to adjust your system values for Daylight Savings time and wait for the OK. Make this value a “N” if you want Atomic Time Manager 400 to automatically adjust your system values for Daylight Savings time. Note that if on the first screen you elected not to adjust for daylight savings time this option will have no effect on the program.

NTP Configuration Screen

ATM-400 can automatically setup and configure you SNTP program so that your software and hardware clocks will remain synchronized with a network time server. The

NTP Configuration screen allows you to adjust these settings and is shown in Figure 44-3.

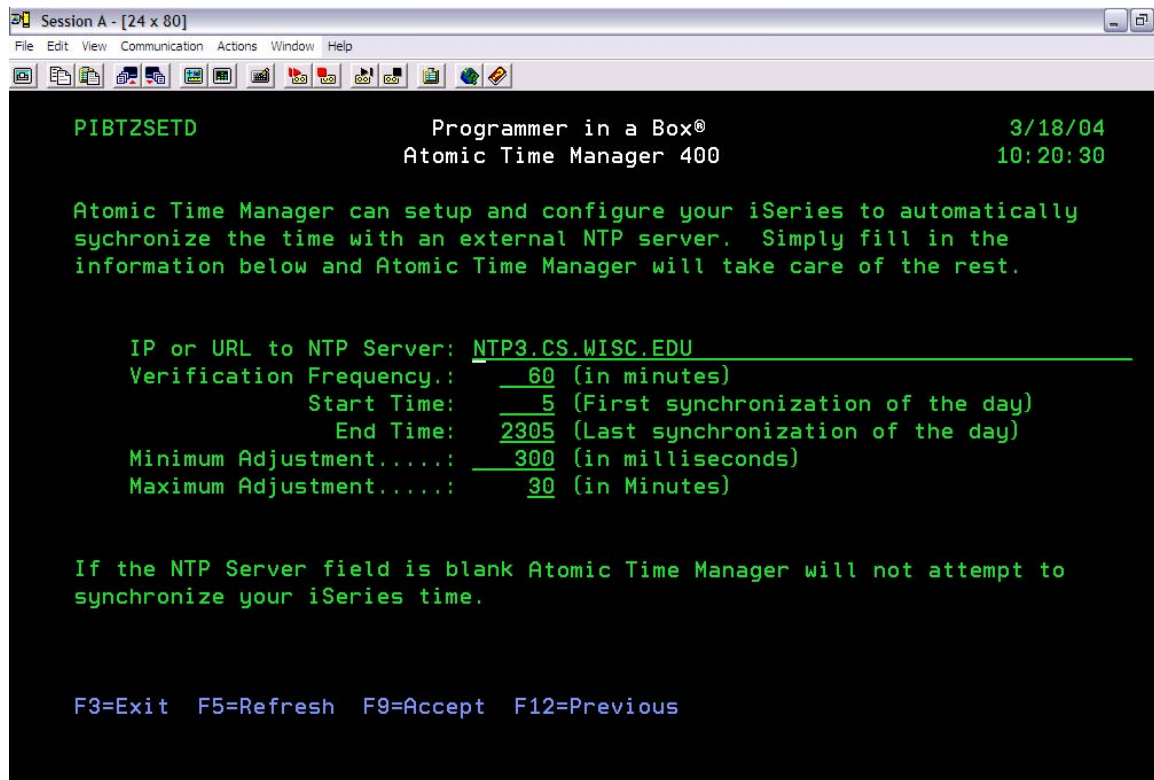


Figure 4-3, this screen allows you to adjust your iSeries SNTP settings.

IP or URL to NTP Server

The IP address or the URL to the NTP Time Server. A list of free NTP servers can be found at www.ntp-servers.com. The current version of ATM400 only accepts host names. If you do not have DNS configured for your time server, enter a host table entry for the IP in your HOSTS table using CFGTCP command. The next release of ATM400 will support direct entry of IP addresses.

Verification Frequency

This field sets the frequency, in minutes, that the program checks your hardware clock versus the time server. Setting the frequency at 60 causes the program to check the time every hour. The **Start Time** field allows you to set the time of day when the program should begin executing. In Figure 44-3, the setting shown is 5 which cause the program to start five minutes after midnight. The **End Time** field allows you to set the time of day when you wish the program to cease executing. In Figure 44-3, the setting 2305 causes the program to cease operations at 11:05 PM.

Minimum Adjustment

The threshold, in milliseconds, between the NTP server time and the AS400 software clock time. When the difference is less than this value, the AS400 software clock will not be adjusted.

Maximum Adjustment

The threshold, in minutes, between the NTP server time and the AS400 software clock time. When the difference is above this value, the AS400 software clock will not be adjusted.

Scheduling Synchronization Screen

This screen lets ATM-400 create the entries in your job schedule to automatically adjust your time values. Figure 44-4 shows an example of this screen.

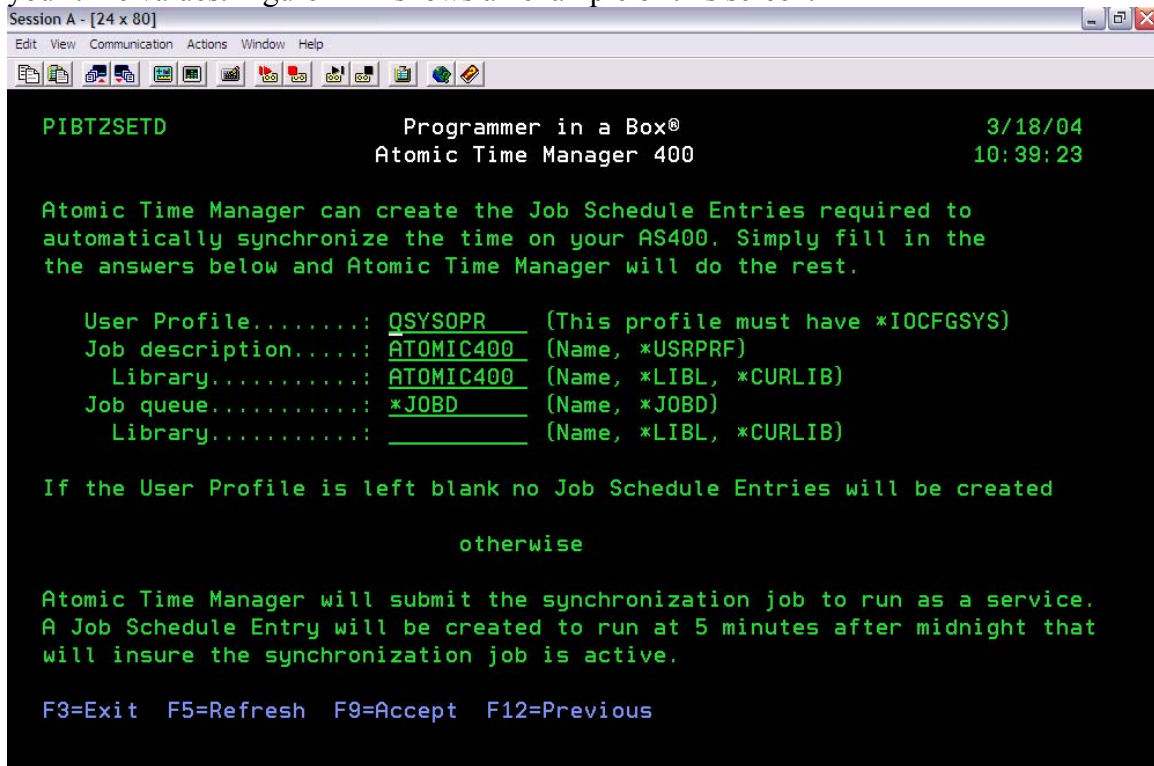


Figure 4-4, this screen allows ATM-400 to automatically create your time synchronization schedule entries.

User Profile

This field contains the name of a user profile to be used by the Atomic Time Manager 400 synchronization job. This profile must have *IOCFGSYS in order to set system values. If you leave the field blank, no jobs will be scheduled.

Job Description and Library

These fields contain the Library and name of a job description to use when scheduling the synchronization jobs. This job description must have ATOMIC400 in its library list. A default job description, ATOMIC400, is installed in the ATOMIC400 library and can be used for this purpose.

Job Queue and Library

These fields should contain the job queue and library to use when scheduling the synchronization job.

User Exit Program Screen

ATM-400 can automatically call a user exit program whenever the time needs to be adjusted. The screen, shown in Figure 44-5, can be accessed after you configure the scheduling of your time synchronization jobs.

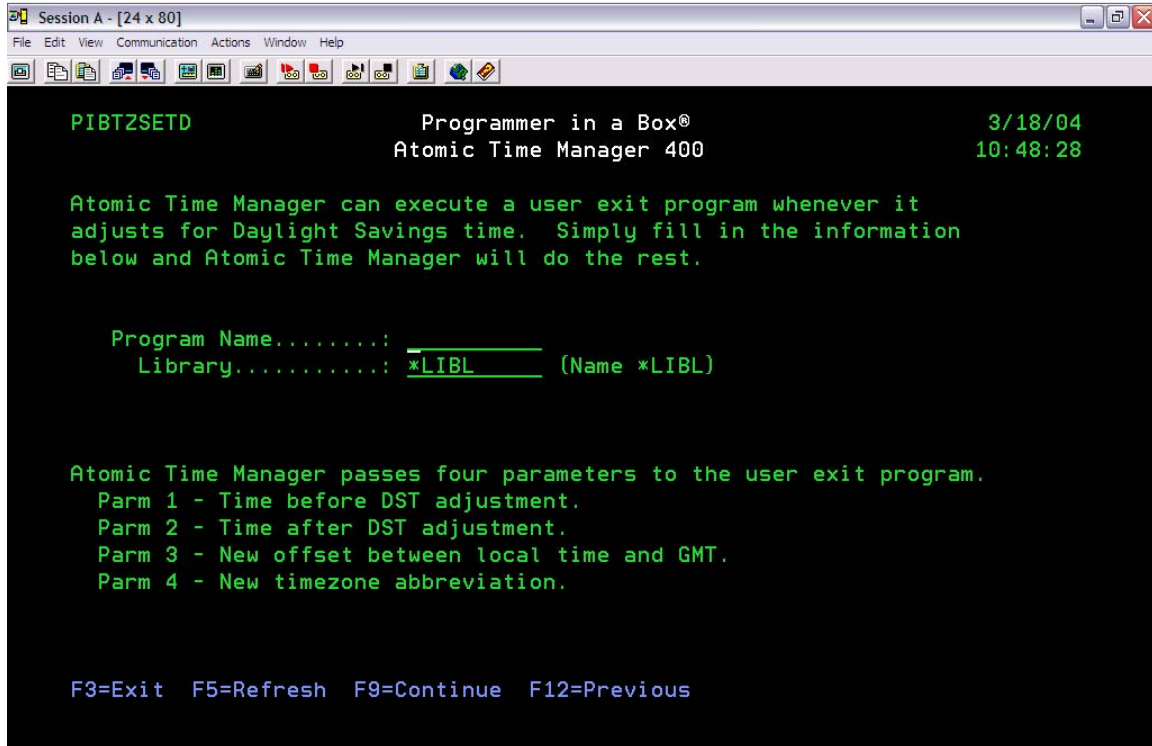


Figure 4-5, this screen allows you to configure a user exit program to be called when the time needs adjustment.

Program Name

This field contains the name of a site-specific program to call whenever the ATM-400 synchronization job adjusts for Daylight Savings Time. This program must accept three parameters. These parameters are:

- Time before DST adjustment. 6 alpha, format (HHMMSS)
- Time after DST adjustment. 6 alpha, format (HHMMSS)
- New offset between local time and GMT. 5 alpha, format (+-HHMM)
- New timezone abbreviation.

Library

This field contains the name of the library where the site-specific program lives.

Save and Activation Screen

This screen, Figure 44-6, is shown after all program options have been set. Once F9 is pressed, ATM-400 will activate and place the appropriate entries into your job schedule.

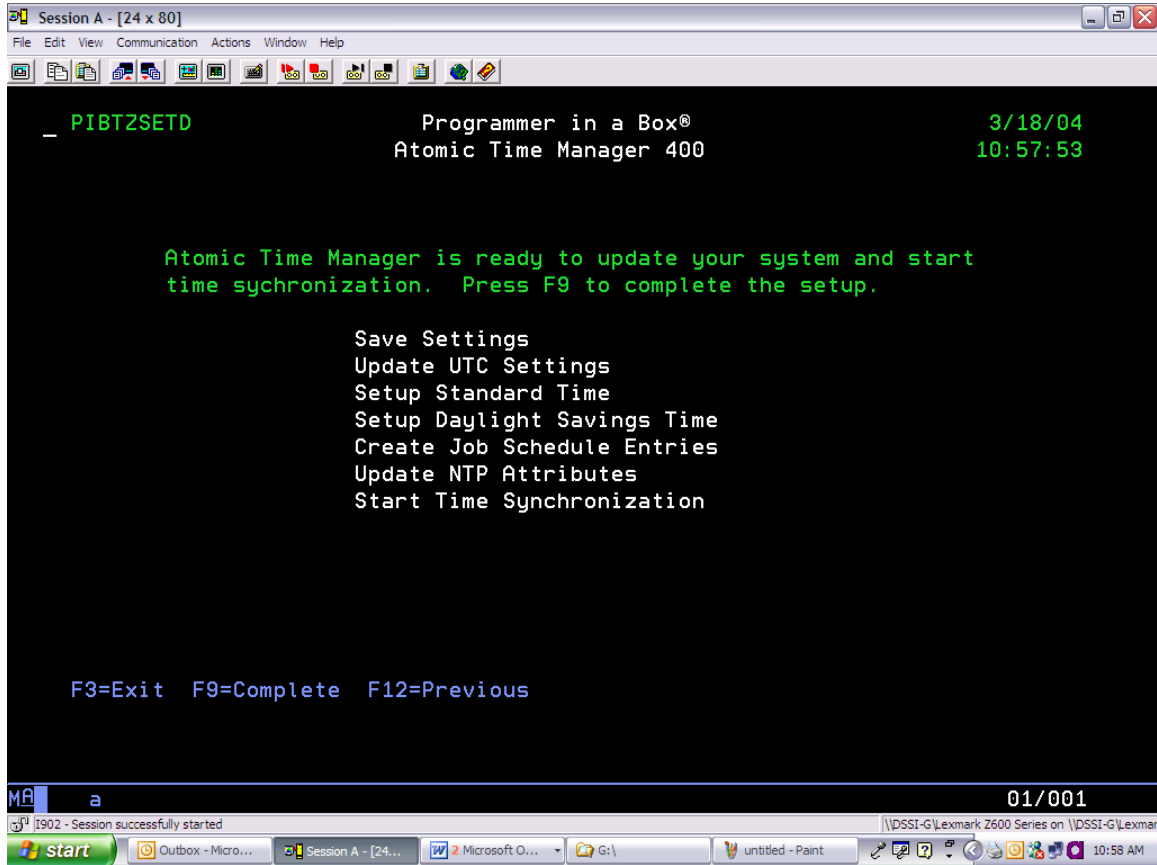


Figure 4-6, this is ATM-400's activation screen.

5. Deployment Scenarios

ATM-400 is very versatile in its configuration options, so there are many ways that you might choose to set up your time network. The following sections deal with three scenarios deal with how you might deploy the product.

Syncing with your Windows network

Microsoft Windows servers can act as time servers for your network. Your Primary Domain Controller, (PDC), acts as a time server to all Windows machines in your organization that connect with the PDC. The PDC will automatically attempt to synchronize its clock with time.Microsoft.com or with a network time device or internet location if you have changed the default configuration. You might want to point ATM-400 at the IP address of your PDC, and then your iSeries will be synchronized with all of the Windows clients and servers on your network.

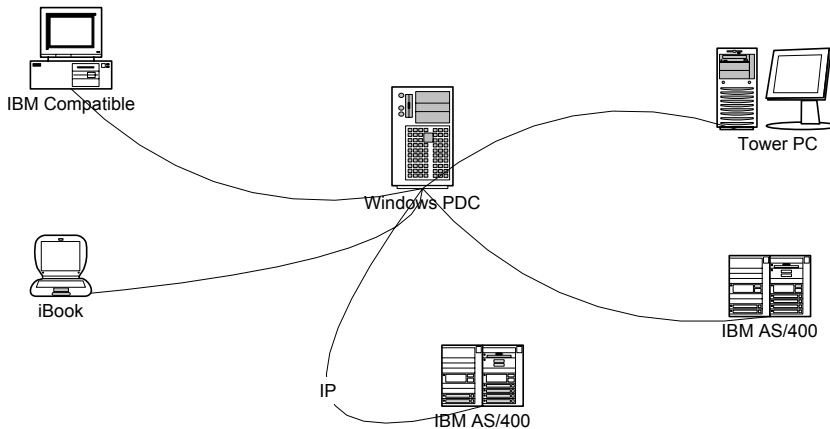


Figure 5-1, Pointing your iSeries machines to a windows Primary Domain Controller

Syncing with an internal time device

You can purchase a network time device to act as a synchronization point for all machines on your network. In this scenario, you could point each machine to the time device, or point your PDC to the device and point all machines on your network to the PDC.

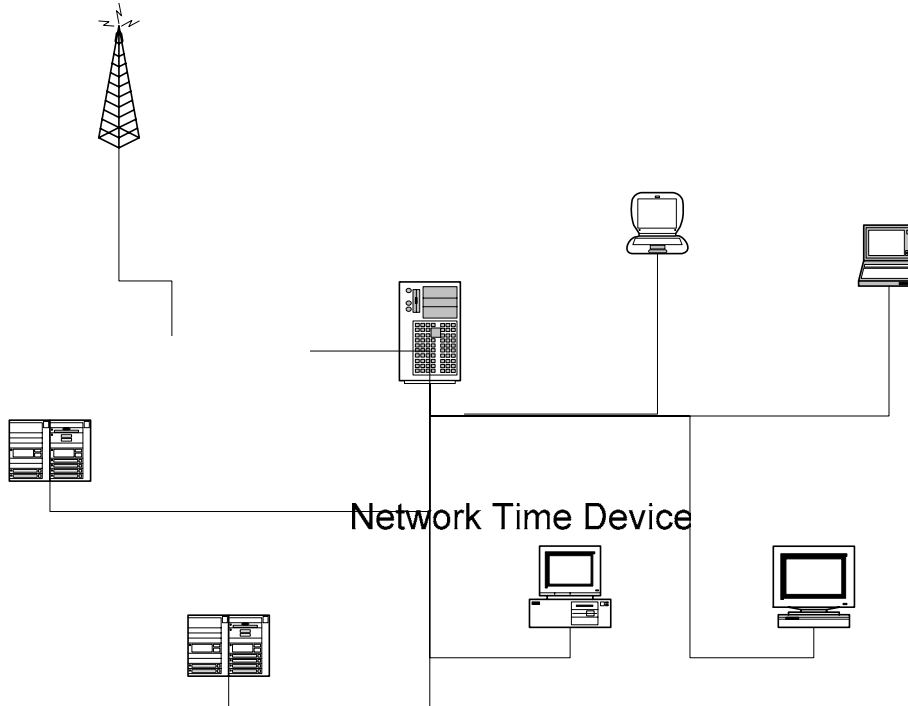


Figure-5-2 This figure shows how a PDC can connect to a network time device and then serve time to all devices on your Windows network.

An alternate to the configuration in Figure-5-2 is to point all devices on the network to the network time device rather than the primary domain controller. This means that if the primary domain controller is unavailable or becomes corrupted, the network devices will still maintain correct time.

Syncing with an external server

Windows PDC

You could point your iSeries machines to a time server available on the Internet. This is not recommended as many internet time servers are overloaded. However, you might choose to point a single machine on your network to point to an internet time source and then point all machines on the network to that machine. Figure 5-3 shows a representation of this scenario.

IBM AS/400

IBM

IBM AS/400

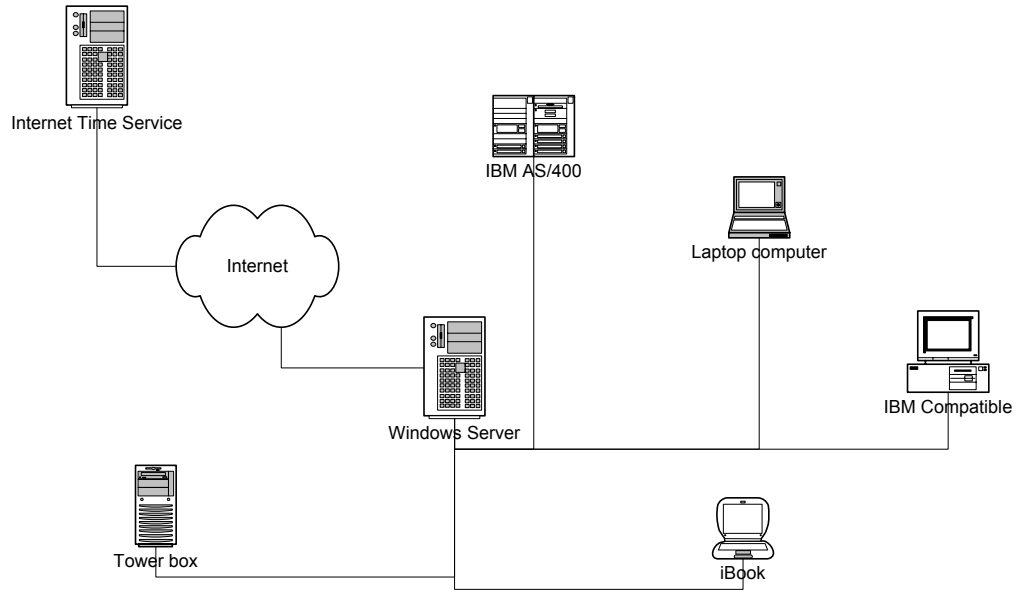


Figure 5-3 Using an internet time server

Syncing with a time device

Another scenario is to sync with an internal clock system in your factory. Many commercial timekeeping systems are controlled by a PC which is connected to the master clock system in a facility. Many of these commercial systems can act as time servers. This configuration allows all clocks and time clocks in factory to be synchronized with all PC and other computers in a facility.

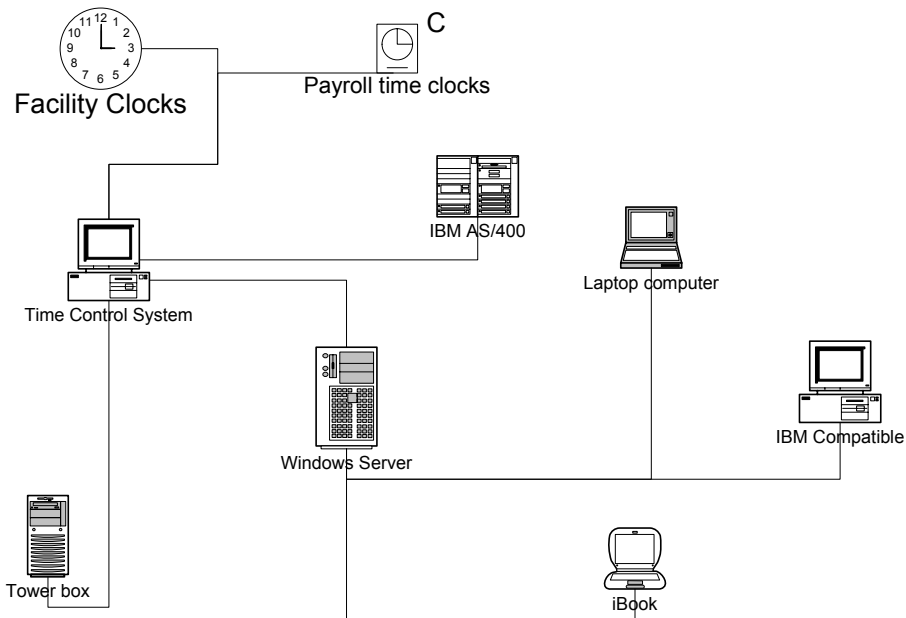


Figure 5-4 Synchronizing to a facility clock management system.

6. Appendices

The following pages offer maps for the time zones of the world. These images are from the CIA World Fact Book. A very useful site for time zone information is www.WorldTimeZone.com

North and South American Time Zones



Western Europe and Africa



Russia, China, Japan, Australia

