iProMOH – iMCM
Time, Time Zone
& Timers
Application Note

AN-22-011-00

Browser Time   Server Time   UTC Time

iProMOH Time
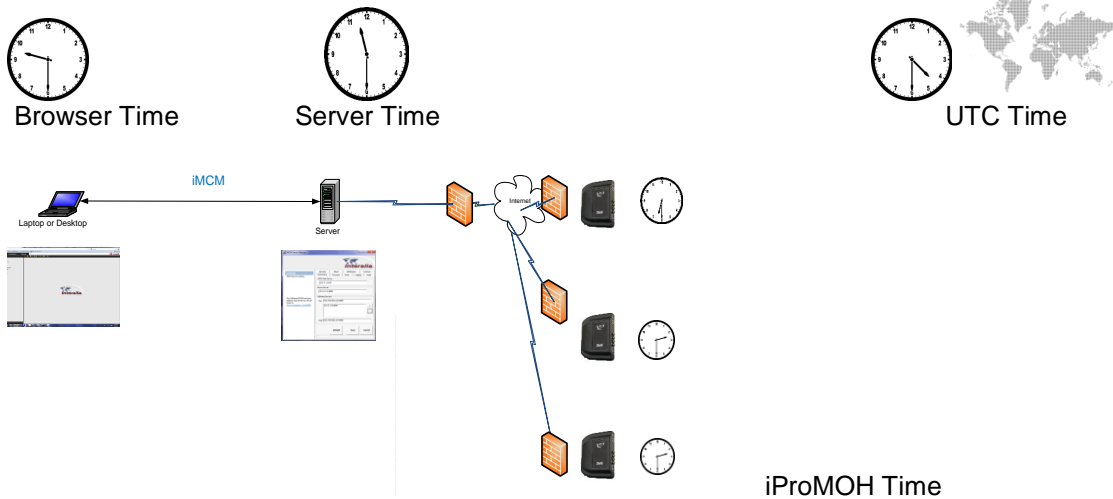
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Version & Application Note Type

Rev	Date	App Note Type
011	July 23rd 2012	Time, Time Zone & Timers

Associated Products

Ref	Interalia Products Associated with the Application Note
1	iProMOH V4
2	iMCM
3	

Target Audience

Audience	Description	Applicable
Advanced IT	Advanced IT Experienced in Network Terminology and Tools	Yes
IT Lite	Basic IT knowledge	Yes
Non IT Level	Minimal Technical Background	Yes

Network Tools, Equipment & Procedures

| Tools	Description	Applicable
iMCM – iProMOH System	Access to iMCM and iProMOH	Yes
Laptop	Laptop to access iMCM	Yes
Ethernet Crossover Cable	Required if PC does not support automatic crossover	Optional
Installer Web Application	Web Application Tool resident in 64MB iProMOH's Note:Legacy or 32MB Flash iProMOH's do not support the Installer Web Application	Yes
Windows Resource Monitor	Menu to resident Performance Monitoring Tool	No
Wireshark	Load monitoring tool on to PC and ability to set filter parameters	No
Ethernet TAP	Configure Ethernet TAP with Wireshark	No
Basic10/100 Multiport Switch	Advanced IT Experienced in Network Terminology and Tools	No
Telnet	Basic IT knowledge	No
Putty or Other Serial Window		No

Table of Contents

1 Overview

This Application Note describes the temporal aspects of the various elements that make up the iMCM - iProMOH system. It assists in the basic knowledge necessary to schedule multiple iProMOH's distributed geographically over multiple time zones. It assists in understanding how to interpret support log timestamps and will answer some miscellaneous questions such as *what occurs during Daylight saving time transitions* or *how is leap year handled.*

The Application Note will discuss the time zone assignments for the local iProMOHs , the iMCM server time (time zone of the server) , the browser time (which in some instances may reside in a different time zone as the server). It also discusses the use of UTC or *Coordinated Universal Time* for those who are unfamiliar with this world wide temporal reference.

This Application Note discusses scheduling issues such as Daylight Savings Time and Leap Year (Feb 29th). Time related items such as configuring the Stale Date (on the iProMOH's Configuration page) are also discussed.

Finally various timers used in the iProMOH are identified to assist in understanding detailed operation of specific components of the iMCM – iProMOH system operation.
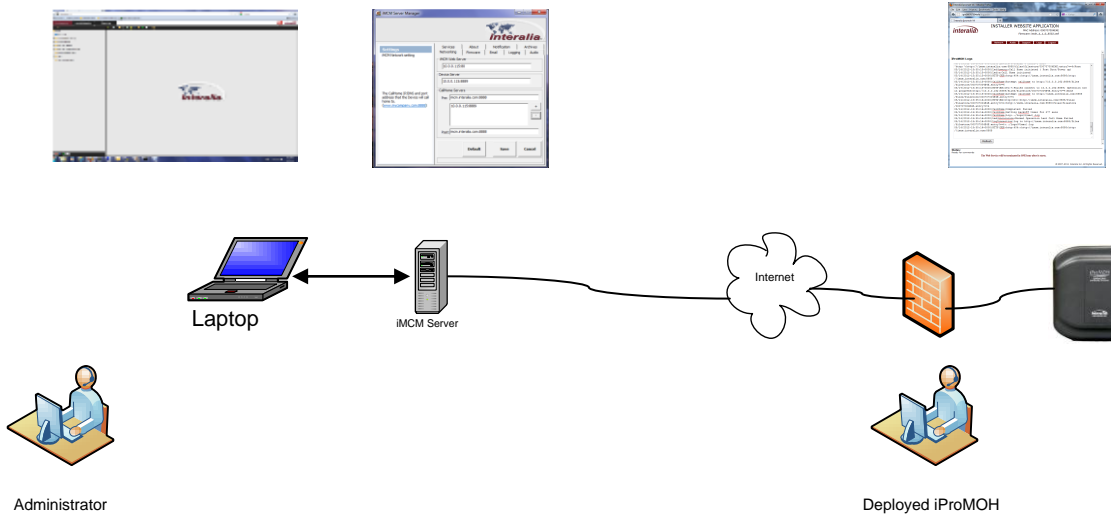

iProMOH Local Time(s)
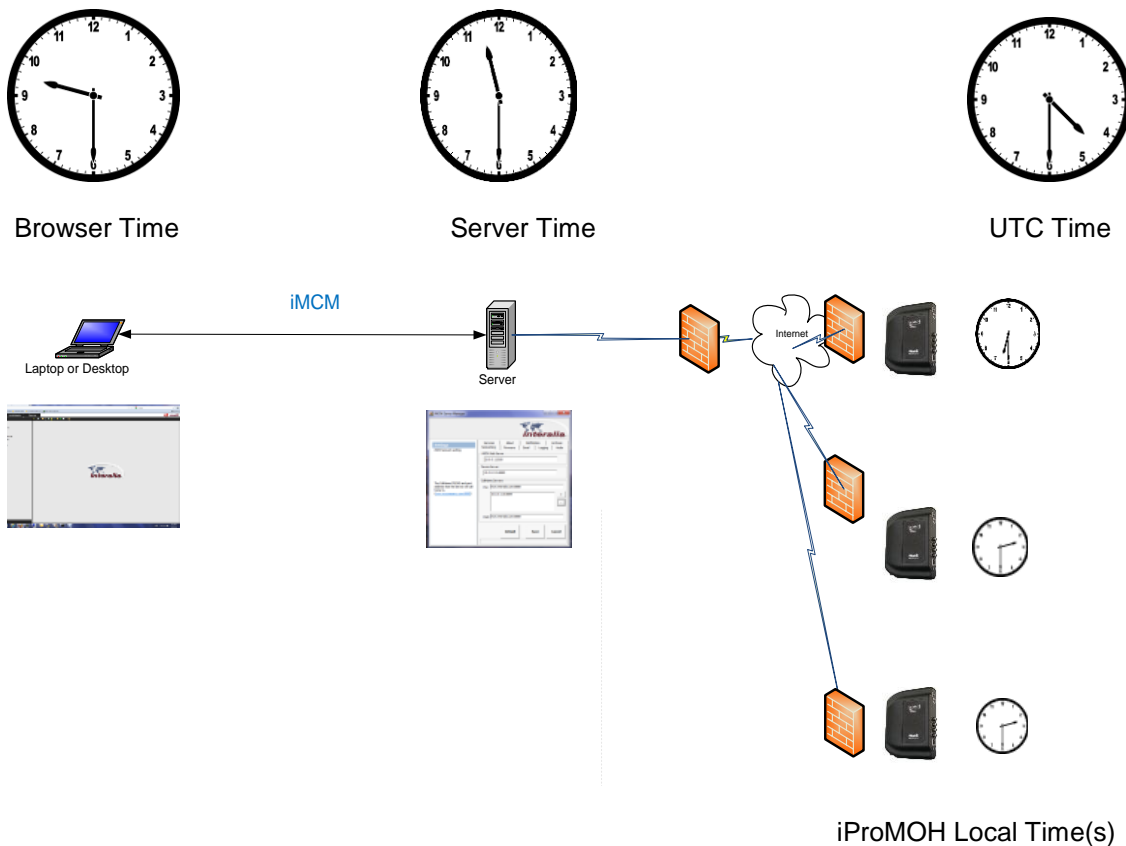
2 Equipment & Setup Basics

2.1 Equipment

The recommended equipment for this Application Note:

Basic access to a iMCM-iProMOH system will assist in understanding the concepts' discussed in this Knowledge Transfer Application Note.

1. iMCM-iProMOH System

3 Knowledge Transfer

3.1 Coordinated Universal Time or UTC Time

Coordinated Universal Time or UTC Time is a worldwide time standard reference. It is one of the successors to Greenwich Mean Time (GMT). It is used by internet and network equipment to synchronize the clocks used by computers and networking devices. Network equipment and computing devices (servers) obtain the current UTC time from UTC servers.

3.2 iProMOH's

3.2.1 iProMOH's Operate on Local Time

The server on which the iMCM resides knows the current UTC time. When the iProMOH calls home to the IMCM it has the current UTC time and its local Time Zone downloaded. The iProMOH uses UTC time to calculate its local time and then correctly executes its audio schedules in local time.

All schedules are based on local time and audio playback operates on local time. Thus the administrator inputs schedules into the iMCM management software in iProMOH local time.

3.2.2 iMCM Assigns the Time Zone and Current Time

The iProMOH is assigned a time zone by the administrator. The administrator enters the time zone into the iMCM by selecting the configuration tab and then selecting the iProMOH from the folder tree view. A Time Zone pull down menu is presented and selected on the iProMOH Configuration Page. When the iProMOH completes a successful call home the iProMOH has this Time Zone assigned and its clock is updated with the correct time.
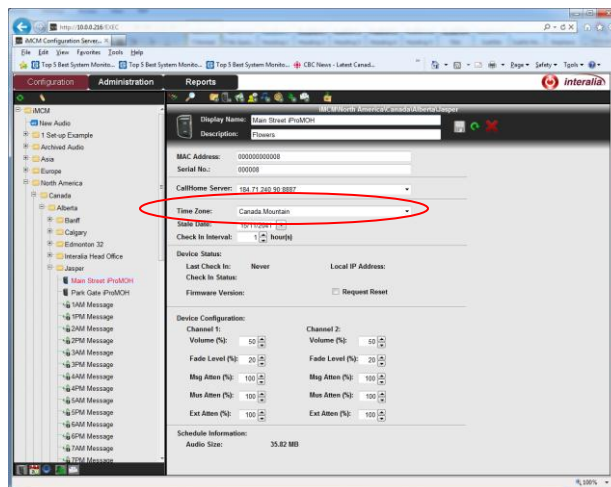
iProMOH Configuration Page

In the above example the "Main Street iProMOH" will operate on Canadian Mountain Time.

3.2.3 Temporary Power Outages & iProMOH Real Time Clock

The iProMOH has a real time clock which continues to operate for several days after the iProMOH has its power removed.

If power is re-applied after a couple of days outage the iProMOH will maintain the correct time. It will continue to execute scheduled audio announcements with or without calling home to the iMCM.

When power is re-applied after several weeks of no power, the iProMOH will not maintain the correct time. It will maintain its Time Zone setting, audio content and schedule. Upon power up it will call home to the iMCM to re-synchronize its clock and date. If the iMCM is temporarily unavailable it will use a default time and date (prior to 2009) to execute its schedule.

3.2.3.1 IMCM Log Timestamps after Prolonged iProMOH Power Outage

After a prolonged iProMOH power outage, the first successful call home will have the iProMOH send logs to the iMCM. The iMCM will determined these timestamps on the logs to be invalid (i.e. occur prior to 2009). These logs, with invalid time stampes, will all be assigned the current server timestamp to allow for technical support viewing.

If all the logs have the same timestamp then the iMCM has determined that the logs sent from the iProMOH have an invalid timestamps and it assigns the a common timestamp with the current time.

Sometimes this is interpreted as a fault of the iProMOH, but it is not, only the result of the system presenting useful information for technical support when the internal iProMOH clock is incorrect (i.e. after the iProMOH reprogrammed, reset to system default or after a long power outage).

3.2.4 Out of Box Behavior

When shipped from the factory the iProMOH's real time clock will operate using the last factory time and Time Zone setting. This will last for several days. After a week or so the real time clock will stop and the iProMOH will default to its default date/time. This explains why the initial iProMOH support logs have a discontinuous jump in its log timestamps as it makes the transition using the default time/time zone (interpreted as invalid) to a updated time and time zone during its first call home event.

3.2.5 Daylight Savings Time

The iProMOH automatically converts to local daylight savings time according to its assigned time zones observance of DST. For example when configured to operate in Canadian Mountain Time the iProMOH will adjust its time at 2:00am on the second Sunday in March and revert back at 2:00am on the first Sunday in November.

When configured to **Canada.Saskatchewn** Time the iProMOH will not adjust to DST as Saskatchewn does not observe DST.

If the iProMOH is configured to operate on a European Time Zone it would convert on the last Sunday in March and revert back on the last Sunday in October.

These decisions are made based on the assigned time zone.

The playback during DST transitions would be as is scheduled. The hour repeated would play from 1:00 am to 2:00 again (Fall back). The hour skipped (2:00 to 3:00am) would be missed (Spring forward).

3.2.6 Leap Year
The iProMOH automatically accounts for leap year, Feb 29th every 4 years.

3.3 Browser

Typically the server and browser session will be in the same time zone, as such, no time zone adjustment is made.

In the situation where the browser is in a different time zone than the server, no adjustment is made to account for the browsers time zone.

All information references to server local time and local iProMOH time will be maintained.

3.4 iMCM

The iMCM acquires the UTC time from the Server's (or computer's) operating system on which it resides. The Windows operating system is set to automatically synchronize itself using UTC time.

Browser Time   Server Time (IMCM)   UTC Time

iProMOH Local Time(s)
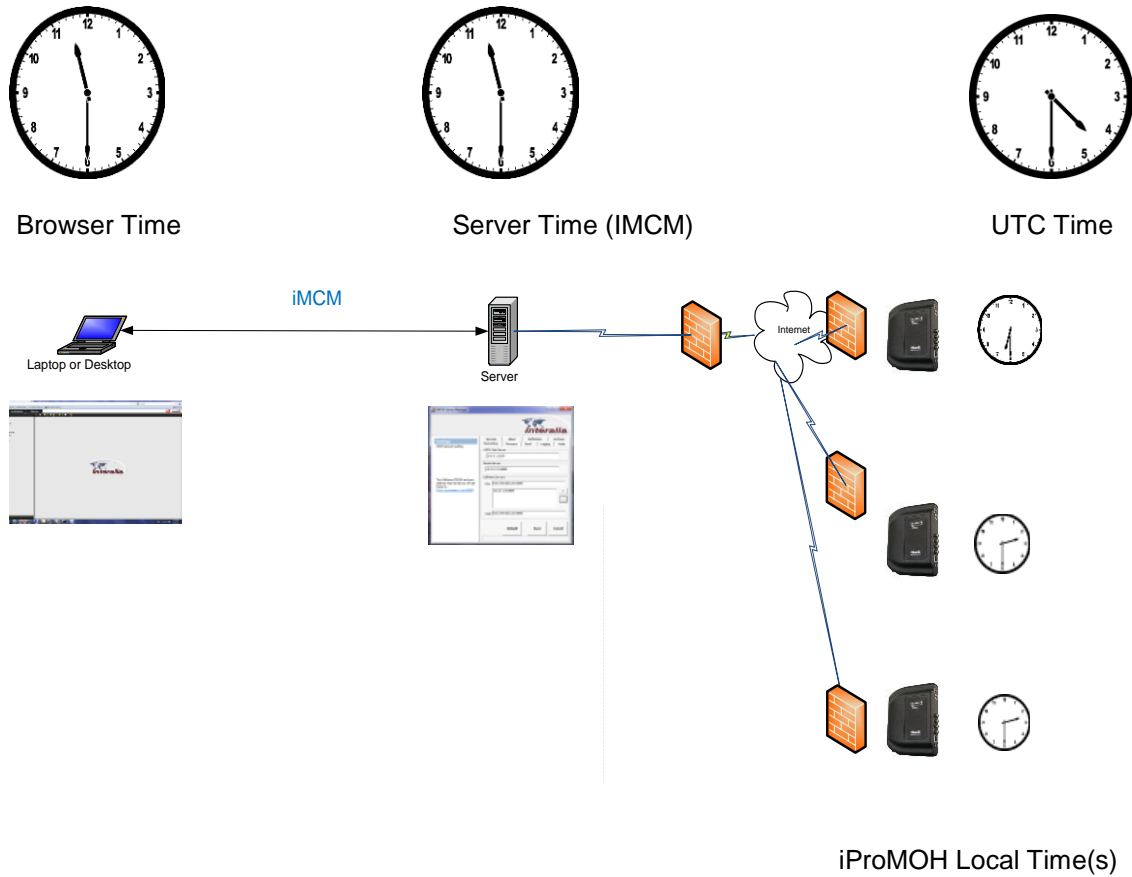
3.4.1 System Clocks

The iMCM downloads the UTC time to the iProMOH when the iProMOH successfully calls home. The iProMOH's will use the UTC time and its assigned time zone to execute scheduled audio playback in local time.

3.4.2 Schedules and Reports

The administrator schedules audio to play based on the iProMOH's local time. The schedules are executed on iProMOH local time. The logging occurs within the iProMOH and as such the reports are time stamped based on the iProMOH's local time.

If the timestamp on the information uploaded from the iProMOH is interpreted as invalid (i.e. prior to 00:00 Jan 1st 2009) then the present server time is assigned to the batch of timestamps.

3.4.3 iProMOH Configuration Page
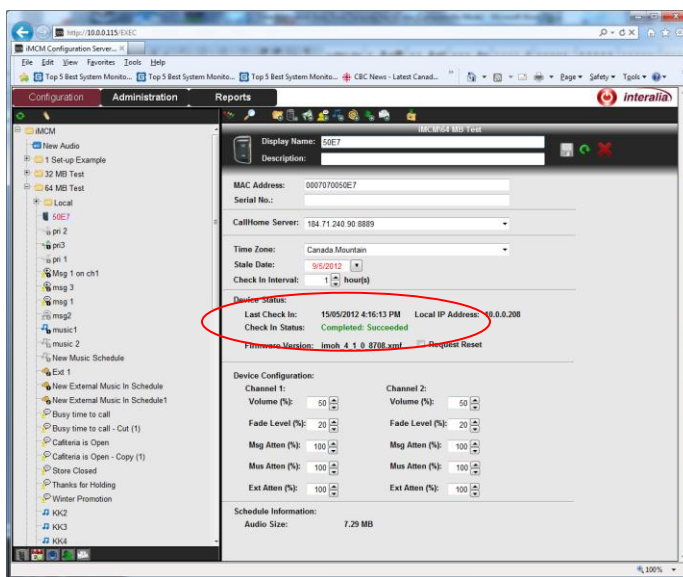
3.4.3.1 Updates to Configuration Page

The iMCM does not update the Configuration Page immediately after the iProMOH checks in. There will typically be a minute or so lag between the time the iProMOH Checks in and when the users can view the latest updates on the configuration page or the most recent iProMOH logs. iProMOH's are configured to call home on a daily or at best hourly rate. Typically, the minute or so lag for the iMCM to display these updates to a user is not perceivable.

3.4.3.2 Stale Date

The stale date is a tool used to disable the iProMOH's audio playback. The audio playback is stopped after the stale date is reached but the iProMOH continues to operate. Stale date operates on local time.

The default stale date is set to a far distant future date (i.e. 1/1/2040) so it does not unintentionally discontinue audio playback.

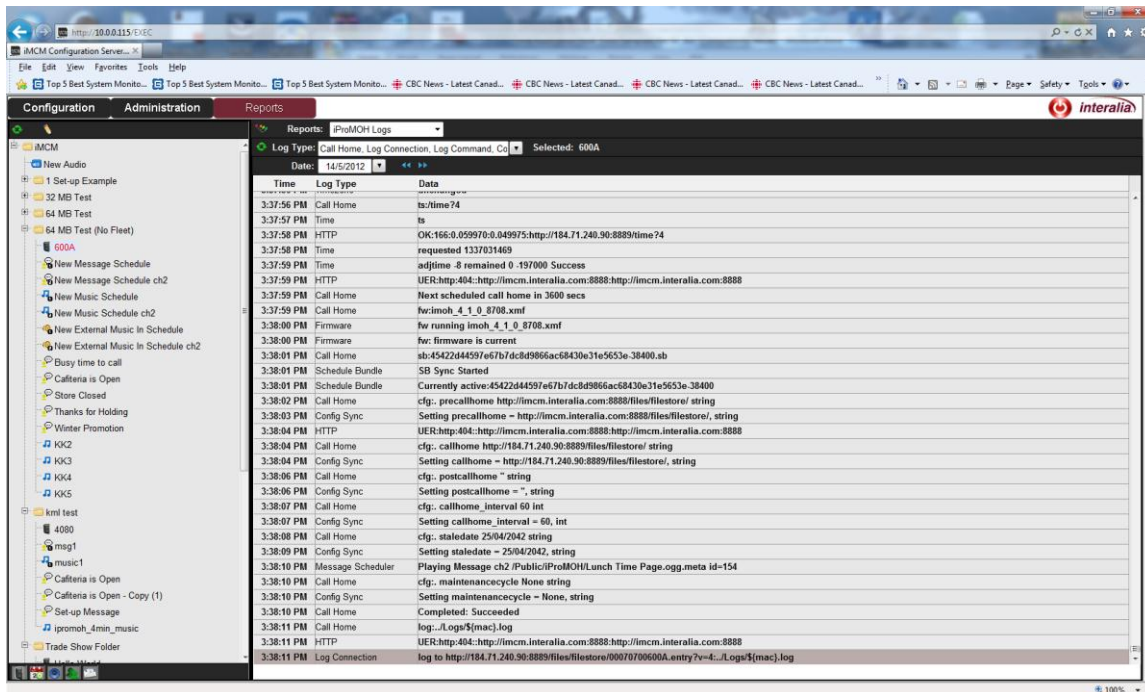This feature is typically administered for users who lease the iProMOH hardware for a monthly fee.

3.4.3.3 Device Status: Last Check in

This is the last time the iProMOH checked in to the iMCM. The timestamp for the check in is displayed on the iProMOH Configuration page. **The timestamp is displayed in Server time.**
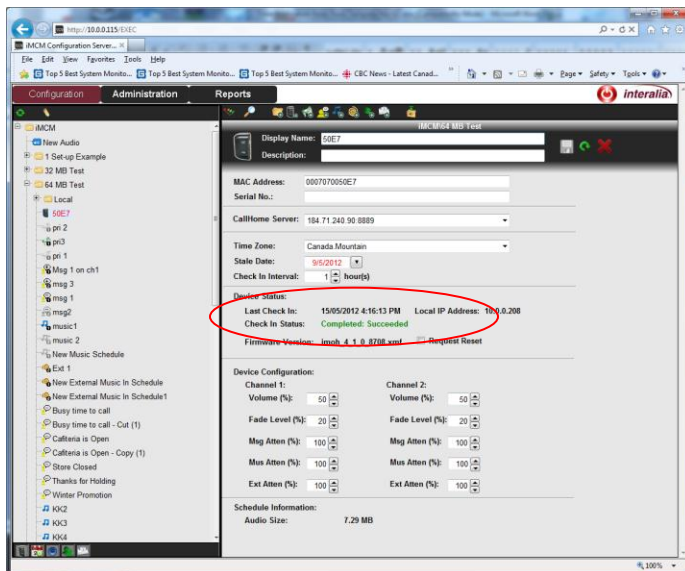
3.4.4 Logs

3.4.4.1 iProMOH Logs
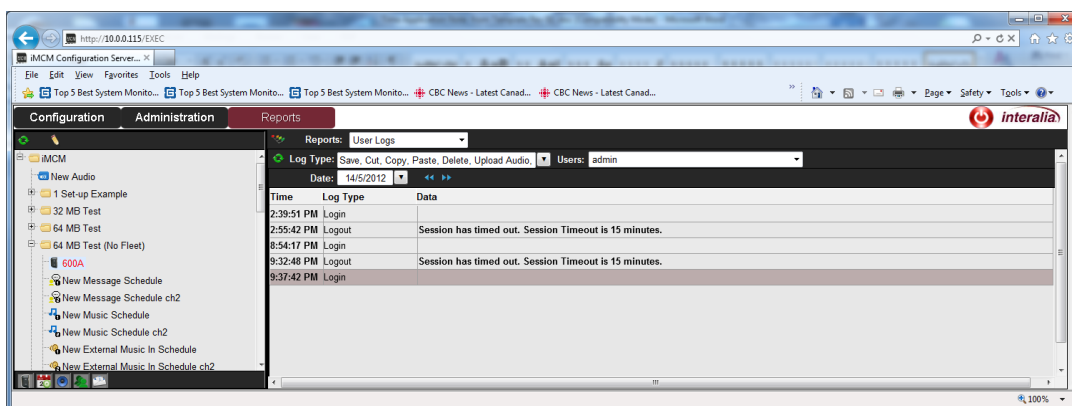
The logs of the iProMOH are uploaded upon a successful Call Home. This is a wealth of information and used for troubleshooting network issues, technical support of the iProMOH and for report generation. **The timestamp of the iProMOH logs is based on the local time of the iProMOH.**
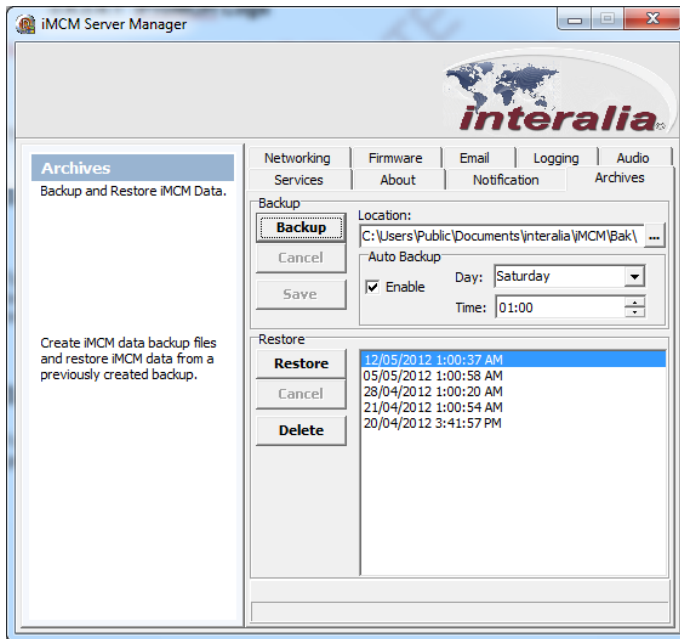

3.4.4.2 User Logs

The User Logs track administrative changes to the iMCM. The timestamp of the **User Logs is in UTC time.**

3.5 iMCM Service Manager

The iMCM Service Manager allows for scheduling system backups for archiving the iMCM-iProMOH configurations and settings.

The Backup date and time is referenced to the local server time.

3.6 Web Installer Application

To enhance technical support the Web Installer Application provides a Tab to view the logs generated within the iProMOH. These **logs post both local time and the UTC offset**.
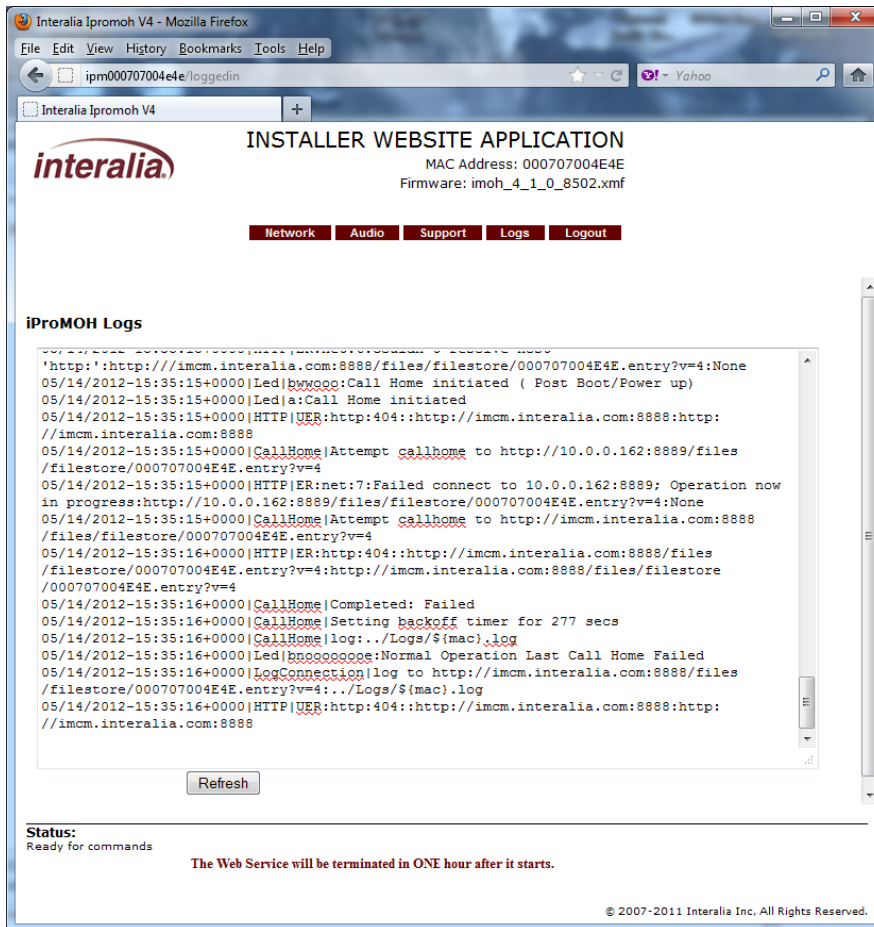
3.6.1 "One hour to Live" Timer

The **Installer Website Application** has a limited duration of operation and will terminate itself one hour after the iProMOH powers up. This allows 1 hour use of the support tools during the initial setup. A power cycle of the iProMOH will restart the **Installer Website Application** should additional time be required. Installation settings takes typically 5 min to accomplish, as such, the need for additional power cycles are unlikely. Its limited existence is intentional to limit long term access. It will cease to be an administration entry point one hour after power is applied. This keeps the iProMOH secure during its long term connection to the network.