

Sync Feature – User Guide

Windows NTP server installation & setup

In the Windows based machine which is going to be used as the NTP server, make sure you have a permanent IP address.

Go to the Control Panel -> Date and Time -> Internet Time -> Change settings... -> now check the checkbox of "Synchronize with an Internet time server" (if it is not checked) and press the "Update now" in order to update the Windows time from internet (this will put the clock in sync). Then uncheck that checkbox (so it will not hold NTP port 123) and press "OK".

In the Windows firewall, open port 123 for inbound and outbound calls for the private network.

Once in a while (a week would be fine) stop the NPTD with the monitor (which will be installed later) below and sync again with internet time (this can be automated with nightly batch file). The ideal is that the server clock will not be updated from internet during opening hours, to avoid sudden time jumps which can result in loss of sync for some time. It can be run scheduled during connectivity window.

Note the player the can connect to any custom port if server supports it, but there seems no such setting for the server below.

For the NTP server, install this: <https://www.meinbergglobal.com/english/sw/ntp.htm>

For the NTP monitor, install this: <https://www.meinbergglobal.com/english/sw/ntp-server-monitor.htm>

While installing, do not change the defaults.

Now, you need to configure the NTP server, by doing the following changes in the configuration file (C:\Program Files\NTP\etc\ntp.conf):

Comment the lines (by adding # in the beginning of the line):

restrict -6 ::1 (since we have no need for ipv6)

server pool.ntp.org iburst minpoll 6 maxpoll 7 (not sure you'll find this line at all, but the idea here is that this NTP server will serve from its local clock and not from the internet with an undefined period)

You should make sure you have the 5 following lines:

restrict 127.0.0.1

restrict 10.100.102.0 mask 255.255.255.0 nomodify notrap nopeer

[replace 10.100.102.0 with the local IP address of the NTP server, which should be a permanent IP, and leave the last segment as zero. Example: if the server's IP is 10.0.0.8, you should put there 10.0.0.0; also, replace 255.255.255.0 which is the subnet mask with the real subnet mask of the NTP server. This will allow serving to the appropriate LAN]

driftfile "C:\Program Files\NTP\etc\ntp.drift"

server 127.127.1.0

fudge 127.127.1.0 stratum 12

Run the NTP monitor as administrator (go to C:\Program Files\meinberg\ntp_time_server_monitor, right click the file mbgtsmon.exe and choose "Run as administrator"). Restart the NTP service: in the first tab, "NTP Service", click the "Restart NTP Service". You need to make sure that the service status is changed to "Stopped" and then to "started". Also, notice that the "Start Type" of the service is set to "Automatically"

In the third tab, "NTP Configuration File", you can alter the configuration (rather than using Notepad++), in case you need.

In the second tab, "NTP Status" you should see a "LOCAL" entry only.

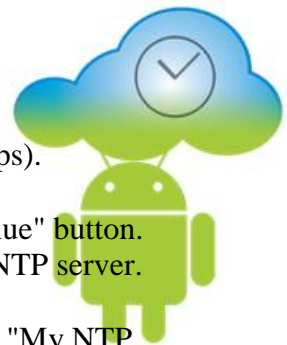
[An alternative can be to install an NTP server on some Android boxes, as there are plenty on the market. However, few popular we tried stopped serving after a while, being killed/restarted by Android when in background. It also requires binding permanent IP in DHCP, but maybe worth to check. Probably, the easiest future path is an Ubuntu server on a proxy machine. In the meanwhile, Windows NTP server will do the job well.]

Android NTP server installation & setup

If you like you can install an NTP server for Android, which can run on one of your Android units (which also serves as a signage player). This way, no need for another machine and no need to use Windows.

Here are the instructions:

- 1) Search the Google Play store for "time server".
- 2) One of the first results should be "Time Server" (by Ice Cold Apps).
- 3) Install this app and then open it.
- 4) Every time when you start the app, you need to press the "Continue" button.
- 5) In the top button bar, press the "Add" button, in order to add an NTP server.
- 6) Now, you have to fill some details:
 - i. In the "Server name" field, give it any name you like (i.e. "My NTP Server").
 - ii. In the "Run on port", you can stay with the default or press the "Get random port" button which will randomize a port number for you (i.e. let's assume that the port is 41700).
 - iii. Check the "Start on boot" checkbox.
 - iv. Right click to leave the server's settings and then you'll get a confirmation box asking you "Do you want to save the settings?". Press the "Yes" button.
- 7) Click the new NTP server which you have just created and a popup window will appear in the center.
- 8) Choose the "Start/Stop" option and the server will start (you can see that its status, below its name, will be "started - port 41700").
- 9) Click the "Settings" button in the top button bar.
- 10) Check 2 more checkboxes: "Start the app on boot" and "Save all server settings to the sdcard".



- 11) Right click to leave window and then you will get a confirmation box asking you "Do you want to save the settings?...". Press the "Yes" button.
- 12) Click the "Info" button in the top button bar. Here you can see the IP address of this Android device. Remember it (let's assume it is 10.0.0.2 for the example). Click the "Close" button.
- 13) Click the "Exit" button in the top button bar (to apply all the settings).
- 14) Start the "Time Server" app again.
- 15) Exit the app by right clicking the mouse (so it will keep running in the background).
- 16) Start NoviSign app on this Android device. In the app's settings, the "Clock Server" setting (under the "Play Sync" block) should be 127.0.0.1:41700 (127.0.0.1 is the local host IP address, while the 41700 is the port, in our example).
- 17) In other devices (Android, Windows or Chrome OS) which should be synched with this NTP server, the value of this setting should be 10.0.0.2:41700 (the server's IP address and the port, in our example).
- 18) Try to reboot the Android device with the NTP server, to see that the NTP server automatically starts after the device reboot.

Android player apps configuration

Download and install the Android app and/or the Windows app.

The settings you need to change are:

[Note there is currently might be a bug, if you change the sync settings without toggling "Playback Clock" on and off, the change may not apply until player app restart (force stop). The simple workaround is to toggle Playback Clock switch to opposite, exit settings, enter settings, toggle back and change values before exit from settings.]

Playback Clock

When ON, binds slide playback trigger timing to a clock. You should set this to ON.

Reference Time

Starting point for sync calculation. Should be at least few rounds before the store is open but enough time after connectivity window close, to allow completing all updates. The default 6:00. You should change it maybe to one hour before the store opens.

Clock Server

Enter the permanent IP address of NTP server on standard port 123 (or *IP address:port* if a custom port was set). You should type the permanent IP address of the NTP server which you set above (example: 10.100.102.5).

Clock Update

Clock refresh interval, the default is 1 minute, should be good for LAN. No need to change anything here.

Wait for clock

On player start will not start playback until initial sync was performed. When server is online usually sync is performed far before playback start. Currently this setting or Timing Debug window are the only tools to verify time server connection. No need to change anything here.

Video Accommodation

Delay before starting video playback.

Various devices have different delays on preparing video before playing, some like Minix also have bugs hanging UI for random 1 - 2 sec while probing MP4 format. This delay can vary significantly even across same device types and will result in loss of synchronization even when having perfect pulses. More delay gives more room to amortize these differences between devices on the expense of a black screen between videos. The default is 2 seconds but can be reduced for fast devices (it should be maximum of possible video load delay among all synchronized devices).

No need to change anything here.

Timing Debug

Shows blinking sync indicator and sync traces on top of content.

If there is a problem, but the indicators on the different players are blinking seemingly simultaneously, it means that the players are in sync and the problem is not with pulse synchronization. When the clock server cannot be reached, the indicator becomes red (players still can be in sync for a while if initial update was successful, until clocks diverge too much, on good devices it can be days).

"post delay=xxx" line shows the delay until the accommodation point. If it is zero, accommodation value is not enough. While it is constantly above 500 seconds on all devices, it may be safe to reduce it more to shorten black screen period (if desired). No need to change anything here, but we recommend to start when this setting is turned on, so you'll be able to know if the unit is synced (green circle in the top left corner) or not synced (red circle in the top left corner). Later on, turn this setting to off.

How does it behave?

On the first round, it will be out of sync until the players come to next item. They are expected to start on the same video, but since they do not start at the same time (it is impossible even if start triggered by perfect sync) they will play different parts of the same video. Then they should stop this video simultaneously and play next item together.

They also may be slightly out of sync until device is 'warmed up' – the content is cached and the device boot duties are finished. Until then, weak devices may have long, varying delays for loading the video but probably would sort it out after some time.

Feature Limitations?

Currently we assume that devices of the same type (though enough *Video Accommodation* above in theory can allow sync between different devices of the same

OS type). **Currently, only background video-to-video transition mode is supported.**

Currently, we support a playlist of a single creative with a slideshow widget synchronization. Multiple creatives or simple video/image creatives are not supported yet.