Setting System Time Dynamically from a SNTP Server for 200, 300, & 500 Series Managed Switches

Objective:

System time can be set manually by the user, dynamically from a Simple Network Time Protocol (SNTP) Unicast/ Multicast/Anycast server, or synchronized from the PC running the GUI. Synchronized system clocks provide a frame of reference for all devices on the network. Network time synchronization is critical to managing, securing, and debugging networks. Synchronized Time also plays an important role in shared file systems because it eliminates confusion with version differences and modification times. The switch always configures the time, time zone and GUI as part of the boot process.

The objective of this document is to show you how to configure the time settings on the SG200, SG300 and SG500 Series switches for SNTP Network Time Synchronization.

Applicable Devices:

- Cisco Small Business 200 series Managed Switches
- Cisco Small Business 300 series Managed Switches
- Cisco Small Business 500 series Managed Switches

Software Versions:

• 1.3.0.59

Setting the System Time:

Step 1. Log into the web configuration utility. The default username is "cisco" and the default password is "cisco".

Step 2. Navigate to **Administration > Time Settings > System Time**. The *System Time* page opens:

ynamic Time Zone and Daylight Saving Time configurations from	DHCP, if received, override ma	nual configurations.		
ctual Time (Static): 16:49:12; 2013-Mar-14;				
ast Synchronized Server: Unsynchronized				
Clock Source Settings				
Main Clock Source (SNTP Servers):	📄 Enable			
Alternate Clock Source (PC via active HTTP/HTTPS sessions): 🛅 Enable			
Manual Settings				
Set the date and time manually, or click here to import them fr	rom your computer.			
O Date:	2013-Mar-14	YYYY-MMM-DD		
CLocal Time:	16:49:12	HH:MM:SS		
Time Zone Settings				
Get Time Zone from DHCP:	Enable			
Time Zone from DHCP:	N\A			
Time Zone Offset:	UTC			
Time Zone Acronym:		(0/4 Characters Used)		
Daylight Savings Settings				
Daylight Savings:	Enable			
🛱 Time Set Offset:	60	min (Range: 1 - 1440, Default: 60)		
Daylight Savings Type:	 USA European 			
	 By dates Recurring 			
# From:		YYYY-MMM-DD	HH:MM	
😂 To:		YYYY-MMM-DD	HH:MM	
© From:	Day: Sun 🖵 Week:	First 🚽 Month: Jan 🖵 Time: 00:00		HEMM
Ø In	Dav. Sun - Week	First - Month: Jan - Time: 00:00		HE MM

At the top of the page the following fields are displayed:

• Actual Time (Static) – Displays the actual time on the device. It also displays the time zone if specified.

• Last Synchronized Server – Displays information from the SNTP Server including the address, stratum, and type of server. If your device does not connect to an SNTP server this field displays "Unsynchronized".

Step 3. Under *Clock Source Settings*, click the **Enable** checkbox to the right of the *Main Clock Source (SNTP Servers)*.

System Time	
Dynamic Time Zone and Daylight Saving Time configurations for	rom DHCP, if received, override manual configurations.
Actual Time (Static):	16:40:26; 2013-Mar-14;
Last Synchronized Server:	Unsynchronized
Clock Source Settings	
Main Clock Source (SNTP Servers):	Enable
Atternate Clock Source (PC via active HTTP/HTTPS session	ons): The Enable
· · · · · · · · · · · · · · · · · · ·	
Manual Settings	
Set the date and time manually, or click here to import the	m from your computer.
🗱 Date:	2013-Mar-14 YYYY-MMM-DD
🛱 Local Time:	16:40:26 HH:MM:SS
Time Zone Settings	
Get Time Zone from DHCP:	Enable
Time Zone from DHCP:	N\A
Time Zone Offset:	UTC 🗨
Time Zone Acronym:	(0/4 Characters Used)
Daylight Savings Settings	
Daylight Savings:	Enable
🗱 Time Set Offset:	60 min (Range: 1 - 1440, Default: 60)
Daylight Savings Type:	 USA European By dates Recurring
🗱 From:	YYYY-MMM-DD HH:MM
\$\$ To:	YYYY-MMM-DD HH:MM

Step 4. At the bottom of the System Time page click **Apply** to save the current settings.

Step 5. Navigate to **Administration > Time Settings > SNTP Unicast**. The *SNTP Unicast* opens:

SN The	ITP Unicast Main Clock Soun	ce (SNTP Serv	ers) must be enabled for	SNTP Client Uni	cast to op	erate. Main Clock	Source (SNTP S	ervers) is c	urrently enabled.
SI	NTP Client Unicas	st: 📝 Enable								
	Apply C	ancel								
U	nicast SNTP Ser	ver Table								
	SNTP Server	Poll Interval	Authentication Key ID	Stratum Level	Status	Last Response	Offset	Delay	Source	Interface
0	results found.									
	Add	Delete								

This page displays the following information for each Unicast SNTP server:

• SNTP Server — Specifies the SNTP server IP address, the preferred server, or the hostname that is chosen according to its stratum level.

- Poll Interval Displays whether polling is enabled or disabled.
- Authentication Key ID Key identification used to communicate between the SNTP

server and the device.

• Stratum Level — Distance from the reference clock (expressed as a numerical value). An SNTP server cannot be the primary server (stratum level 1) unless polling interval is enabled.

- Status SNTP server status. The possible values are:
 - Up SNTP server is currently operating normally.
 - Down SNTP server is currently not available.
 - Unknown SNTP server is currently being searched for by the device.

– In Process — Occurs when the SNTP server has not fully trusted its own time server (i.e. when first booting up the SNTP server).

• Last Response — Date and time of the last response received from this SNTP server.

• Offset — Specifies the average offset of the server's clock relative to the local clock (in milliseconds). The host determines the value of this offset using the algorithm described in RFC 2030.

• Delay — Average round-trip delay time of packets traveling over the network between server and local clocks (in milliseconds). The host determines the value of this delay using the algorithm described in RFC 2030.

- Source How the SNTP server was defined.
- Interface The interface on which packets are received.

Step 6. At the bottom of the Unicast SNTP Server Table field click Add.



Step 7. After clicking **Add**, the *Add SNTP Server* page opens:

Server Definition:	⊚ By IP address ⊚ By name
IP Version:	Version 6 Version 4
IPv6 Address Type:	link Local 💿 Global
Link Local Interface:	VLAN 1 👻
SNTP Server IP Address	
券 SNTP Server:	time-a.timefreq.bldrdoc.gov 👻
Poll Interval:	Enable
Authentication:	Enable
Authentication Key ID:	V
Apply Close)

Step 8. In the *Server Definition* field, select **By IP address** if the SNTP server is going to be identified by its IP address, or **By name** if you are going to select a well-known SNTP server by name from the list. If By name is selected, skip to step 12.

Note: To specify a well-known SNTP server, the device must be connected to the Internet and be configured to use either a DNS server or DHCP to identify a DNS server. (See DNS Settings)

Server Definition:	⊚ By IP address ⊚ By name
IP Version:	Version 6 Version 4
IPv6 Address Type:	Link Local O Global
Link Local Interface:	VLAN 1 🖵
SNTP Server IP Address:	
券 SNTP Server:	time-a.timefreq.bldrdoc.gov 👻
Poll Interval:	Enable
Authentication:	Enable
Authentication Key ID:	•
Apply Close	

Step 9. In the *IP Version* field, select the version of the IP address: Version 6 or Version 4. If Version 4 is selected, skip to step 12. Version 4 is selected by default.

Server Definition:	By IP address By name
IP Version:	Version 6 Version 4
IPv6 Address Type:	💿 Link Local 🔘 Global
Link Local Interface:	VLAN 1 💌
SNTP Server IP Address:	
₩ SNTP Server:	time-a.timefreq.bldrdoc.gov 👻
Poll Interval:	Enable
Authentication:	Enable
Authentication Key ID:	
Apply Close)

Step 10. (Optional) If you chose IPv6, select the IPv6 address type next to the *IPv6 Address Type* field. If Global is selected, skip to Step 12.

Server Definition:	💿 By IP address 🔘 By name
IP Version:	Version 6 O Version 4
IPv6 Address Type:	💿 Link Local 💿 Global
Link Local Interface:	VLAN 1 💌
SNTP Server IP Addres	s:
券 SNTP Server:	time-a.timefreq.bldrdoc.gov 💌
Poll Interval:	Enable
Authentication:	Enable
Authentication Key ID:	
Apply Close	

• Link Local — The IPv6 address uniquely identifies hosts on a single network link. A link local address has a prefix of FE80, is not routable, and can only be used for communication on the local network. Only one link local address is supported. If a link local address exists on the interface, this entry replaces the address in the configuration.

• Global — The IPv6 address is a global Unicast IPV6 type that is visible and reachable from other networks.

Step 11. If you chose **IPv6 Address Type Link Local** in step 10, select the link local interface from the list.

Server Definition:	By IP address By name
IP Version:	Version 6 O Version 4
IPv6 Address Type:	Iink Local Global
Link Local Interface:	VLAN 1 🖵
SNTP Server IP Address	
₩ SNTP Server:	time-a.timefreq.bldrdoc.gov 👻
Poll Interval:	Enable
Authentication:	Enable
Authentication Key ID:	V
Apply Close)

Step 12. If **By IP address** was selected in the *Server Definition* field, enter the SNTP server IP address in the *SNTP Server IP Address* field. The format depends on which address type was selected.

	Server Definition:	💿 By IP address 🔘 By name
	IP Version:	Version 6 • Version 4
	IPv6 Address Type:	💿 Link Local 💿 Global
	Link Local Interface:	VLAN 1 💌
(SNTP Server IP Address:	192.168.1.100
-	SNTP Server:	time-a.timefreq.bldrdoc.gov 👻
	Poll Interval:	Enable
	Authentication:	Enable
	Authentication Key ID:	
	Apply Close	

If **By Name** was selected in the *Server Definition* field, select the desired SNTP Server from the SNTP Server drop down list.

Server Definition:	💮 By IP address 💿 By name
IP Version:	Version 6 Version 4
IPv6 Address Type:	link Local 💿 Global
Link Local Interface:	VLAN 1 👻
SNTP Server IP Address:	
SNTP Server:	time-a.timefreq.bldrdoc.gov 💌
Poll Interval:	time-a.timefreq.bldrdoc.gov time-b.timefreq.bldrdoc.gov
Authentication:	time-c.timefreq.bldrdoc.gov
Authentication Key ID:	
Apply Close)

When specifying an SNTP server, if choosing to identify it by hostname, three suggestions are given in the GUI:

- time-a.timefreq.bldrdoc.gov
- time-b.timefreq.bldrdoc.gov
- time-c.timefreq.bldrdoc.gov

Step 13. In the *Poll Interval* field, check the **Enable** checkbox to allow polling for system time information on the SNTP server. All SNTP servers that are registered for polling are polled, and the clock is selected from the server with the lowest stratum level (distance from the reference clock) that is reachable. The server with the lowest stratum is considered to be the primary server. The server with the next lowest stratum is a secondary server, and so forth. If the primary server is down, the device polls all servers with the polling setting enabled, and selects a new primary server with the lowest stratum.

Server Definition:	💿 By IP address 🔘 By name
IP Version:	💿 Version 6 💿 Version 4
IPv6 Address Type:	💿 Link Local 💿 Global
Link Local Interface:	VLAN 1 👻
🔅 SNTP Server IP Address	: 192.168.1.100
券 SNTP Server:	time-a.timefreq.bldrdoc.gov 👻
Poll Interval:	🔽 Enable
Authentication:	Enable
Authentication Key ID:	
Apply Close)

If you want to enable SNTP Authentication refer to <u>Enabling SNTP Authentication on 200,</u> 300, <u>& 500 Series Managed Switches</u>. Step 14. Click **Apply** at the bottom of the current page to return to the *SNTP Unicast* page.

IP Version:	Version 6 Version 4	
IPv6 Address Type:	💿 Link Local 💿 Global	
Link Local Interface:	VLAN 1 👻	
SNTP Server IP Address:	192.168.1.100	
🕸 SNTP Server:	time-a.timefreq.bldrdoc.gov 👻	
Poll Interval:	📝 Enable	
Authentication:	Enable	
Authentication Key ID:	-	
Apply	,	

The page should show adjusted values in the Unicast SNTP Server Table

SNTP Unicast								
SNTP Client Unicast: I Enable								
Apply Cancel								
Unicast SNTP Server Table								
SNTP Server Poll Interval Authentication Key ID	Stratum Level	Status	Last Response	Offset	Delay	Source	Interface	
🗆 192.168.2.1 Enabled 0	255	Down	31.12.1899 0:0:0	0	0	Static		
Add Delete								

Step 15.In the SNTP Client Unicast field, click the Enable checkbox.

SNTP Client Unicast: 🕢 Enable	
Apply Cancel	

Step 16. Click Apply.

	The Main Clock Source (SNTP Servers) must be enabled for SNTP Client Unicast to operate. Main Clock Source (SNTP Servers) is currently enabled.
	SNTP Client Unicast: 🗹 Enable
(Apply Cancel
	Unicast SNTP Server Table

Step 17. From here, you can click **Save** located at the top right corner of the page, or the **Copy/Save Configuration** page link.



Step 18. Save the running configuration into the startup configuration by choosing the **Running Configuration** in the *Source File Name* field and the **Startup Configuration** option in the *Destination File Name* field.

Copy/Save Configuration All configurations that the switch is currently using are in the running configuration file which is volatile and is not retained between reboots. To retain the configuration between reboots, make sure you copy the running configuration file to the startup configuration file after you have completed all your changes.		
Source File Name:	Running configuration Startup configuration Backup configuration Mirror configuration	
Destination File Nam	C Running configuration Backup configuration	
Sensitive Data:	 Exclude Encrypted Plaintext Available sensitive data options are determined by the current user's SSD rules 	
Save Icon Blinking:	Disabled	
Apply Cancel Enable Save Icon Blinking		

Step 19. At the bottom of the *Copy/Save Configuration* page click **Apply** to save the configuration settings.

C	Copy/Save Configuration				
Al To	All configurations that the switch is currently using are in the running configuration file which is volatile and is not retained between reboots. To retain the configuration between reboots, make sure you copy the running configuration file to the startup configuration file after you have completed all your changes.				
	Source File Name:	Running configuration Startup configuration Backup configuration Mirror configuration			
	Destination File Name:	 Running configuration Startup configuration Backup configuration 			
	Sensitive Data:	Exclude Encrypted Plaintext Available sensitive data options are determined by the current user's SSD rules			
	Save Icon Blinking:	Disabled			
C	Apply Cancel Enable Save Icon Blinking				