TIME DISSEMINATION SERVICES

The following tables are based on information received at the BIPM between March and May 2019.
AUTHORITIES RESPONSIBLE FOR TIME DISSEMINATION SERVICES

AOS  Astrogeodynamical Observatory
     Borowiec near Poznan
     Space Research Centre P.A.S.
     PL 62-035 Kórnik - Poland

AUS  Electricity Section
     National Measurement Institute
     36 Bradfield Rd
     Lindfield NSW 2070 - Australia

BelGIM  Belarussian State Institute of Metrology
        National Standard for Time, Frequency and Time-scale of the Republic of Belarus
        Minsk, Minsk Region – 220053 Belarus

BEV  Bundesamt für Eich- und Vermessungswesen
     Artlgasse 35
     A-1160 Wien, Vienna - Austria

BoM  Ministry of economy - Bureau of metrology
     Jane Sandanski 109a
     1000 Skopje, Macedonia

CENAM  Centro Nacional de Metrología
       Dirección de Tiempo y Frecuencia
       km. 4.5 carretera a Los Cués
       El Marqués, Querétaro 76246, México.

CENAMEP  Centro Nacional de Metrología de Panamá AIP
        CENAMEP AIP
        Ciudad del Saber
        Edif. 206 Panama

DMDM  Directorate of Measures and Precious Metals
      Group for Time, Frequency and Time Dissemination.
      Mike Alasa 14
      11000 Belgrade
      Serbia

EiM  Hellenic Institute of Metrology
     Electrical Measurements Department
     Block 45, Industrial Area of Thessaloniki
     PO 57022, Sindos
     Thessaloniki, Greece

GUM  Time and Frequency Laboratory
     Główny Urząd Miar – Central Office of Measures
     ul. Elektoralna 2
     PL 00 – 950 Warszawa P–10, Poland

HKO  Hong Kong Observatory
     134A, Nathan Road
     Kowloon, Hong Kong, China
<table>
<thead>
<tr>
<th>Code</th>
<th>Organization</th>
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<tbody>
<tr>
<td>ICE</td>
<td>Instituto Costarricense de Electricidad</td>
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<td></td>
<td>ICE San Jose</td>
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<td></td>
<td>Costa Rica</td>
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<tr>
<td>IGNA</td>
<td>Instituto Geográfico Nacional Argentino</td>
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<td></td>
<td>Servicio Internacional de la Hora</td>
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<td></td>
<td>General Manuel N. Savio 1898</td>
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<td></td>
<td>B1650KLP – Villa Maipú, Provincia de Buenos Aires, Argentina</td>
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<tr>
<td>IMBH</td>
<td>Institute of Metrology of Bosnia and Herzegovina (IMBH)</td>
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<td></td>
<td>Laboratory for time and frequency</td>
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<td></td>
<td>Augusta Brauna 2</td>
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<tr>
<td></td>
<td>71000 Sarajevo, Bosnia and Herzegovina</td>
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<tr>
<td>INACAL</td>
<td>Instituto Nacional de Calidad</td>
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<tr>
<td></td>
<td>Calle De La Prosa 150</td>
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<td></td>
<td>San Borja, Lima 41, Peru</td>
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<td>INM</td>
<td>Instituto Nacional de Metrología de Colombia</td>
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<tr>
<td></td>
<td>Avenida Carrera 50 No. 26 – 55 Interior 2</td>
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<td>Bogotá D.C. – Colombia</td>
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<td>INPL</td>
<td>National Physical Laboratory</td>
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<td>Danciger A bldg</td>
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<td>Givat - Ram, The Hebrew university</td>
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<td></td>
<td>91904 Jerusalem, Israel</td>
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<td>INRIM</td>
<td>Istituto Nazionale di Ricerca Metrologica</td>
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<tr>
<td></td>
<td>Strada delle Cacce, 91</td>
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<tr>
<td></td>
<td>I – 10135 Turin, Italy</td>
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<tr>
<td>INTI</td>
<td>Instituto Nacional de Tecnología Industrial</td>
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<td></td>
<td>Av. General Paz N° 5445</td>
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<td>B1650WAB San Martín</td>
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<td>Buenos Aires, República Argentina</td>
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<td>JV</td>
<td>Justervesenet</td>
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<td>Norwegian Metrology Service</td>
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<tr>
<td></td>
<td>PO Box 170</td>
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<td></td>
<td>2027 Kjeller, Norway</td>
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<tr>
<td>KIM</td>
<td>Puslit Kalibrasi, Instrumentasi dan Metrologi --</td>
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<tr>
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<td>Lembaga Ilmu Pengetahuan Indonesia</td>
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<tr>
<td></td>
<td>Research Centre for Calibration, Instrumentation and Metrology --</td>
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<td>Indonesian Institute of Sciences</td>
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<td>(Puslit KIM – LIPI)</td>
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<td>Kawasan PUSPIPETEK</td>
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<tr>
<td></td>
<td>Serpong Tangerang 15314 Banten - Indonesia</td>
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<tr>
<td>KRISS</td>
<td>Center for Time and Frequency</td>
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<tr>
<td></td>
<td>Division of Physical Metrology</td>
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<tr>
<td></td>
<td>Korea Research Institute of Standards and Science</td>
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<tr>
<td></td>
<td>267 Gajeong-Ro, Yuseong Daejeon 34113</td>
</tr>
<tr>
<td></td>
<td>Republic of Korea</td>
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<tr>
<td>KZ</td>
<td>Kazakhstan Institute of Metrology</td>
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<tr>
<td></td>
<td>Orynbor str., 11</td>
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<tr>
<td></td>
<td>Astana, Republic of Kazakhstan</td>
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</table>
LNE-SYRTE Laboratoire National de Métrologie et d’Essais
Systèmes de Référence Temps-Espace
Observatoire de Paris
61, avenue de l’Observatoire, 75014 Paris – France

LT Time and Frequency Standard Laboratory
Center for Physical Sciences and Technology
Savanoriu av. 231
Vilnius LT-02300, Lithuania

MASM Time and Frequency Standard Laboratory
Mongolian Agency for Standardization and Metrology
Peace avenue 46A, Bayanzurkh district, Ulaanbaatar 13343 Mongolia

METAS Federal Institute of Metrology
Sector Length, Optics and Time
Lindenweg 50
CH-3003 Bern-Wabern
Switzerland

MIKES VTT Technical Research Centre of Finland Ltd
Centre for Metrology MIKES
P.O. Box 1000, FI-02044 VTT, Finland

MSL Measurement Standards Laboratory
Callaghan Innovation
69 Gracefield Road
PO Box 31-310
Lower Hutt – New Zealand

NAO Time Keeping Office
Mizusawa VLBI Observatory
National Astronomical Observatory of Japan
2-12, Hoshigaoka, Mizusawa, Oshu, Iwate 023-0861
Japan

NICT Space-Time Standards Laboratory
National Institute of Information and Communications Technology
4 -2 -1, Nukui-kitamachi
Koganei, Tokyo 184-8795 - Japan

NIM Time & Frequency Laboratory
National Institute of Metrology
No. 18, Bei San Huan Dong Lu
Beijing 100029 - People’s Republic of China

NIMB Time and Frequency Laboratory
National Institute of Metrology
Sos. Vitan - Barzesti, 11
042122 Bucharest, Romania

NIMT Time and Frequency Laboratory
National Institute of Metrology (Thailand)
3/5 Moo 3, Klong 5, Klong Luang,
Pathumthani 12120, Thailand
NIST  National Institute of Standards and Technology
Time and Frequency Division, 688.00
325 Broadway
Boulder, Colorado 80305, USA

NMIJ  Time Standards Group
National Metrology Institute of Japan (NMIJ), AIST
Umezono 1-1-1, Tsukuba, Ibaraki 305-8563, Japan

NMISA  Time and Frequency Laboratory
National Metrology Institute of South Africa
Private Bag X34
Lynnwood Ridge 0040, Pretoria - South Africa

NMLS  Time and Frequency Laboratory
National Metrology Institute of Malaysia
Lot PT 4803, Bandar Baru Salak Tinggi, 43900 Sepang - Malaysia

NPL  National Physical Laboratory
Time and Frequency Group
Hampton Road
Teddington, Middlesex TW11 0LW
United Kingdom

NPLI  Time and Frequency Metrology Section
CSIR-National Physical Laboratory
Dr.K.S.Krishnan Road
New Delhi 110012 - India

NRC  National Research Council of Canada
Metrology
Frequency and Time Standards
Bldg M-36, 1200 Montreal Road
Ottawa, Ontario, K1A 0R6, Canada

NSC IM  Time and Frequency Section
National Scientific Center "Institute of Metrology"
Kharkov - Ukraine Str. Mironositska 42
Region – 61002 Ukraine

NTSC  National Time Service Center
Chinese Academy of Sciences
3 East Shuyuan Rd, Lintong District, Xi'an
Shaanxi 710600, China

ONBA  Servicio de Hidrografía Naval
Observatorio Naval Buenos Aires
Servicio de Hora
Av. España 2099
C1107AMA – Buenos Aires, Argentina
<table>
<thead>
<tr>
<th>Code</th>
<th>Institution</th>
<th>Address and Contact Information</th>
</tr>
</thead>
</table>
| ONRJ | Observatorio Nacional (MCTIC)       | Divisão Serviço da Hora  
Rua General José Cristino, 77 São Cristovão  
20921-400 Rio de Janeiro, Brazil           |
| ORB  | Royal Observatory of Belgium        | Avenue Circulaire, 3  
B-1180 Brussels, Belgium                                               |
| PTB  | Physikalisch-Technische Bundesanstalt | Time and Frequency Department, WG 4. 42  
Bundesallee 100  
D-38116 Braunschweig, Germany                                            |
| RISE | RISE Research Institutes of Sweden  | Box 857  
S-501 15 Borâs  
Sweden                                               |
| ROA  | Real Instituto y Observatorio de la Armada | Plaza de las Tres Marinas s/n  
11.100 San Fernando  
Cádiz, Spain                                                          |
| SG   | National Metrology Centre           | Agency for Science, Technology and Research (A*STAR)  
1 Science Park Drive  
118221 Singapore                                                      |
| SIQ  | SIQ Ljubljana                       | Metrology department  
Trzaska ul. 2  
1000 Ljubljana  
Slovenia                                                             |
| SL   | Measurement Units, Standards and Services Department (MUSSD), Mahenawatta, Pitipana, Homagama, - Sri Lanka  |
| TL   | National Standard Time and Frequency Laboratory | Telecommunication Laboratories  
Chunghwa Telecom. Co., Ltd.  
No. 99, Dianyan Road  
Yang-Mei, Taoyuan, 32661 Taiwan  
Chinese Taipei                                                         |
| TP   | Institute of Photonics and Electronics | Czech Academy of Sciences  
Chaberská 57, 182 51 Praha 8  
Czech Republic                                                        |
| UME  | Ulusal Metroloji Enstitüsü          | Baris Mah. Dr. Zeki Acar Cad. No: 1  
41470 Gebze - Kocaeli  
Turkey                                                               |
| USNO | U.S. Naval Observatory              | 3450 Massachusetts Ave., N.W.  
Washington, D.C. 20392-5420  
USA                                                                  |
VMI Laboratory of Time and Frequency (TFL)
Vietnam Metrology Institute (VMI)
No 8, Hoang Quoc Viet Rd, Cau Giay Dist., Hanoi
Vietnam.

VNIIFTRI All-Russian Scientific Research Institute for Physical Technical and Radiotechnical Measurements,
Moscow Region 141570
Russia

VSL VSL Dutch Metrology Institute
Postbus 654
2600 AR Delft
Netherlands
TIME DISSEMINATION SERVICES

AOS
AOS Computer Time Service:
vega.cbk.poznan.pl (150.254.183.15)
Synchronization: NTP V3 primary (Caesium clock), PC Pentium,
RedHat Linux
Service Area: Poland/Europe
Access Policy: open access
Contact: Jerzy Nawrocki (nawrocki@cbk.poznan.pl)
Robert Diak (kondor@cbk.poznan.pl)

AUS
Network Time Service
Computers connected to the Internet can be synchronized to UTC(AUS)
using the NTP protocol. The NTP servers are referenced to UTC(AUS) either
directly or via a GPS common view link.
Please see
http://www.measurement.gov.au/Services/Pages/TimeandFrequencyDisseminati
onService.aspx for information on access or contact time@measurement.gov.au

Dial-up Computer Time Service
Computers can also obtain time via a modem connection to our dial-up
timeserver. For further information, please see our web pages as above.

BelGIM
Internet Time Service:
BelGIM operates one time server Stratum 1 using the
"Network Time Protocol" (NTP). The server host name is:
http://www.belgim.by (Stratum 1)

BEV
Three NTP servers are available; addresses:
bevtime1.metrologie.at
bevtime2.metrologie.at
time.metrologie.at
more information on http://www.metrologie.at

Provides a time dissemination service via phone and modem to
synchronize PC clocks.
Uses the Time Distribution System from TUG. It has a baud rate of 1200 and
everyone can use it with no cost.
Access phone number is +43 1 21110 826381
The system will be updated periodically (DUT1, Leap Second…).

BoM
Internet Time Service
BoM operates two Stratum 1 NTP server referenced to UTC(BoM).
BoM also operates one time server Stratum 2 using the “Network Time Protocol”
(NTP).
Server Host Name: time.bom.gov.mk

CENAM
CENAM operates a telephone voice system that provides the local time for time
zones in Mexico.
Phone numbers and zones:
+52 (442) 211 0505 → Southeast Time
+52 (442) 211 0506 → Central Time
+52 (442) 211 0507 → Pacific Time
+52 (442) 211 0508 → Northwest Time
+52 (442) 211 0509 → UTC(CNM)
Telephone Code
CENAM provides a telephone code for setting time in computers. For more information about this service please contact time@cenam.mx

Network Time Protocol (NTP)
Operates two time servers using NTP (located at CENAM). Further information at http://www.cenam.mx/hora_oficial/

Web-based time-of-day clock which displays local time for all Mexican time zones. Referenced to CENAM Internet Time Service. Available at http://www.cenam.mx/hora_oficial/

CENAMEP
Network Time Server
A Stratum 1 time server is used to synchronize computer networks of the government institutions and companies in the private sector using the NTP protocol. To access the Network time service, send an email to servicios@cenamep.org.pa

Web Clock
A web clock is used to display the time of day in real time. To access the Web Clock, enter the link http://horaexacta.cenamep.org.pa/

Voice Time Server
An assembly of computers provides the local time. To access the service, call the telephone numbers (507) 5173201, (507) 5173202 and (507) 5173203

DMDM
Internet Time Service (ITS)
DMDM operates two Stratum 1 time servers using the “Network Time Protocol” (NTP), synchronized to UTC(DMDM). Access policy: restricted.
DMDM also operates two Stratum 2 NTP servers:
  vreme1.dmdm.rs or vreme1.dmdm.gov.rs
  vreme2.dmdm.rs or vreme2.dmdm.gov.rs
Access policy: free.
More information on:
http://www.dmdm.rs/en/GrupaZaVremeFrekfencijuIDistribucijuVremena.php#TacnoVreme

Web-based time-of-day clock that displays local time for Serbia referenced to the DMDM ITS. Available at the web page:

EIM
Internet Time Service
EIM operates a time server using the “Network Time Protocol” (NTP). The address hercules.eim.gr is also accessible through IP address 83.212.233.6. This route is offered under a restricted access policy. The server uses the 10 MHz signal from our primary standard as reference and is synchronized to UTC(EIM).

GUM
Telephone Time Service providing the European time code by telephone modem for setting time in computers. Includes provision for compensation of propagation time delay
Access phone number : +48 22 654 88 72

Network Time Service
Two NTP servers are available:
tempus1.gum.gov.pl
tempus2.gum.gov.pl
with an open access policy. It provides synchronization to UTC(PL).
Contact: timegum@gum.gov.pl
Internet Clock Services
HKO operates time-of-day clocks that display Hong Kong Standard Time (=UTC(HKO) + 8 h)
Available as:

Speaking Clock Service
HKO operates an automatic “Dial-a-weather System” that provides a voice announcement of Hong Kong Standard Time.
Access phone number: +852 1878200
(when connected, press “3”, “6”, “1” in sequence)

Network Time Service
HKO operates network time service using Network Time Protocol (NTP). Host names of the NTP servers: stdtime.gov.hk; time.hko.hk (for IPv6 users)

ICE
Network Time Server
A Stratum 1 time server is used to synchronize computer networks of the government institutions and companies in the private sector using the NTP protocol. To access the Network time service, send an email to ofallasc@ice.go.cr

Web Clock
A web clock is used to display the time of day in real time. To access the Web Clock, enter the link:

Voice Time Server
An assembly of computers provides the local time. To access the service, call the telephone numbers (506) 1112

IGNA
GPS common-view data
GPS common-view data using CGGTTS format referred to UTC(IGNA) is available through our website at [http://www.ign.gob.ar/NuestrasActividades/Geodesia/ServicioInternacionalHora/TransferenciaDeTiempo](http://www.ign.gob.ar/NuestrasActividades/Geodesia/ServicioInternacionalHora/TransferenciaDeTiempo)

IMBH
Internet Time Service
IMBH operates several Stratum 1 time servers using the NTP protocol. These servers are directly synchronized to UTC(IMBH).
The servers are available at IP address: 185.12.78.85

Common-view data
GPS and GLONASS common-view data using CGGTTS format referred to UTC(IMBH) are available at request.
Further information can be found at: [http://met.gov.ba](http://met.gov.ba)

INACAL
Network Time Server
A time server is used to synchronize computer networks of the government institutions and companies in the private sector using the NTP protocol. To access the Network time enter the link
[https://www.inacal.gob.pe/metrologia/categoria/sincronizacion-de-sistemas-de-computo](https://www.inacal.gob.pe/metrologia/categoria/sincronizacion-de-sistemas-de-computo)

Web Clock
A web clock is used to display the time of day in real time. To access the Web Clock, enter the link [https://www.inacal.gob.pe/](https://www.inacal.gob.pe/)
INM

Network Time Protocol
Operates a time server using the “Network Time Protocol”, it is located at the Instituto Nacional de Metrología de Colombia, Bogotá D.C., Colombia. Further information at:


Web Clock Service
A web clock is used to display the time of day in real time. The web clock is available at:

http://horalegal.inm.gov.co/

INPL

Time dissemination service is performed in Israel by telecommunication companies, whose time and frequency standards are traceable to local UTC(INPL) time and are calibrated regularly once a year against the Israeli Time and Frequency National Standard kept by INPL.

INRIM (1)

CTD Telephone Time Code
Time signals dissemination, according to the European Time code format, available via modem on regular dial-up connection.
Access phone numbers: 0039 011 3919 263 and 0039 011 3919 264.
Provides a synchronization to UTC(IT) for computer clocks without compensation for the propagation time.

Internet Time Service
INRIM operates two time servers using the “Network Time Protocol” (NTP); host names of the servers are ntp1.inrim.it and ntp2.inrim.it. More information on this service can be found on the web pages:

http://rime.inrim.it/labtf/ntp/.

SRC (Segnale RAI Codificato) coded time signal broadcast 20–30 times per day by “Radio Uno” and “Radio Tre” FM radio stations of the national broadcasting company RAI.

The SRC code dissemination to RAI by INRIM, was definitively interrupted since 2017 January 1st. RAI could decide to continue to disseminate the SRC code to the country via Radio1 and Radio3 channels, but the traceability to UTC will not be guaranteed anymore by INRIM. It is worth highlighting that the SRC code is listed among the ITU Time Dissemination Codes (Rec. ITU-R TF.583-4).

Web-based time-of-day clock that displays UTC or local time for Italy (Central Europe Time), referenced to INRIM Internet Time Service. Provides a snapshot of time with any web browser. A continuous time display requires a web browser with Java plug-in installed.

INTI

Network Time Service:
INTI operates an open access NTP server referenced to UTC(INTI).
Server Host Name: ntp.inti.gob.ar

JV

Network Time Protocol
JV operates an open access stratum 1 server referenced to UTC(JV) ntp.justervesenet.no

Other stratum 1 servers over a separate network are available by special agreement. Contact: hha@justervesenet.no

(1) Information based on the Annual Report 2017, not confirmed by the Laboratory.
KIM (1)

Network Time Protocol (NTP) Service
The NTP time information referenced to UTC(KIM) is generated by Stratum-1 NTP server at
URL: ntp.kim.lipi.go.id or IP: 203.160.128.178
The server also provides time services using Daytime Protocol, and Time Protocol.

KRISS

Telephone Time Service
Provides digital time code to synchronize computer clocks to Korea Standard Time (=UTC(KRIS) + 9 h) via modem.
Access phone number: + 82 42 868 5116

Network Time Service
KRISS operates three time servers using the NTP to synchronize computer clocks to Korea Standard Time via the Internet.
Host name of the server: time.kriss.re.kr (210.98.16.100).
Software for the synchronization of computer clocks is available at http://www.kriss.re.kr

KZ (1)

Network Time Service
Stratum-1 time server using the "Network Time Protocol" (NTP). Restricted access and free access ip 89.218.41.170
Stratum-2 time server using the "Network Time Protocol" (NTP). Free access.
Stratum-2 is available: ip 88.204.171.178

Web-based Time Services:
A real-time clock aligned to UTC(KZ) and corrected for internet transmission delay.
“Six-pip time signals” are broadcast by FM radio stations hourly every day.

LNE-SYRTE

LNE-SYRTE operates several time servers using the “Network Time Protocol” (NTP):
Stratum-1 time server: ntp-p1.obspm.fr (restricted access)
Stratum-2 time server: ntp.obspm.fr (free access)
Further information at: http://syrte.obspm.fr/informatique/ntp_infos.php

LT

Network Time Service via NTP protocol
NTP v3
Host name: laikas.pfi.lt
Synchronization from caesium clock (1 pps)
System: Datum TymeServe 2100 NTP server
Access policy: free
Contact: Rimantas Miškinis
Mail: Laikas@pfi.lt
https://www.ftmc.lt/department-of-metr

MASM

Network Time Service via NTP
It provides synchronization to UTC(MASM)
Address: ntp.mn
System: LANTIME 600
Access policy: free

(1) Information based on the Annual Report 2017, not confirmed by the Laboratory.
METAS  
Internet Time Service  
METAS operates stratum-1 public NTP servers in free access.  
Host names:  
ntp.metas.ch  
metasntp11.admin.ch  
metasntp12.admin.ch  
metasntp13.admin.ch  

MIKES  
VTT MIKES provides an official stratum-1 level NTP service to paying organizations and institutions. Stratum-2 level NTP service is freely available to everyone. Both NTP services are provided over public internet.  
PTP and PTP White Rabbit services are provided to individual customers over dedicated links.  
Further information can be found at http://www.mikes.fi/ntp-palvelu/

MSL  
Network Time Service  
Computers connected to the Internet can be synchronized to UTC(MSL) using the NTP protocol. Access is available for users within New Zealand. Servers are available at pool.msttime.measurement.govt.nz and msttime1.measurement.govt.nz  
Speaking Clock  
A speaking clock gives New Zealand time. Because it is a pay service, access is restricted to callers within New Zealand.  
Further information about these services can be found at http://measurement.govt.nz/about-us/official-new-zealand-time

NAO  
Network Time Service  
Three stratum 2 NTP servers are available. The NTP servers internally refer stratum 1 NTP server that is linked to UTC(NAO). One of the three stratum 2 NTP servers are selected automatically by a round-robin DNS server to reply for an NTP access. The server host name is s2csntp.miz.nao.ac.jp.

NICT  
Telephone Time Service (TTS)  
NICT provides digital time code accessible by computer at 300/1200/2400 bps, 8 bits, no parity. Access number to the lines: + 81 42 327 7592.  
Optical IP Telephone Time Service (OTTS)  
NICT provides digital time code accessible by computer using Network Time Protocol, on Specific Optical IP Telephone lines and available only to agreement users.  
Network Time Service (NTS)  
NICT operates four Stratum 1 NTP time servers linked to UTC(NICT) through a leased line.  
Internet Time Service (ITS)  
NICT operates four Stratum 1 NTP time servers linked to UTC(NICT) through the Internet. Host name of the servers: ntp.nict.jp (Round robin).  
GPS common view data  
NICT provides the GPS common view data based on UTC(NICT) to the time business service in Japan.
NIM  
Telephone Time Service  
The coded time information generated by NIM time code generator, referenced to UTC(NIM). Telephone Code provides digital time code at 1200 to 9600 bauds, 8 bits, no parity, 1 stop bit.  
Access phone number: 8610 6422 9086.  

Network Time Service  
Provides digital time code across the Internet using NTP server via free IP access:  
ntp1.nim.ac.cn  
ntp2.nim.ac.cn  
Further information at: http://en.nim.ac.cn/page/976

NIMB  
1 NTP server is available:  
Address: ntp.inm.ro (STRATUM 1) with an open access policy  
Server is referenced to UTC(NIMB).

NIMT  
Internet Time Services  
NIMT operates 3 NTP servers at:  
  time1.nimt.or.th  
  time2.nimt.or.th  
  time3.nimt.or.th  
The NTP servers are referenced to UTC(NIMT).

FM/RDS Radio Transmission  
The time code is applied to the sub-carrier frequency of 57 kHz using the Radio Data System protocol. The accuracy of time transmission is around 30 ms of UTC(NIMT) depending on the internet traffic. The time code is broadcast via 40 radio stations across the country.

NIST  
Automated Computer Time Service (ACTS)  
Provides digital time code by telephone modem for setting time in computers.  
Free software and source code available for download from NIST.  
Includes provision for calibration of telephone time delay.  
Access phone numbers: +1 303 494 4774 (4 phone lines) and +1 808 335 4721 (2 phone lines).  

Internet Time Service (ITS)  
Provides digital time code across the Internet using three different protocols: Network Time Protocol (NTP), Daytime Protocol, and Time Protocol. (Time Protocol is not supported by all servers)  
Geographically distributed set of multiple time servers at multiple locations within the United States of America. For most current listing of time servers and locations, see: http://tf.nist.gov/tf-cgi/servers.cgi  
Telephone voice announcement: Audio portions of radio broadcasts from time and frequency stations WWV and WWVH can be heard by telephone: +1 303 499 7111 for WWV and +1 808 335 4363 for WWVH. For more information see: https://www.nist.gov/pml/time-and-frequency-division/radio-stations/wwv/telephone-time-day-service

NMIJ  
GPS common-view data  
GPS common-view data using CGGTTS format referred to UTC(NMIJ) are available through the NMIJ's web site for the remote frequency calibration service.

NMISA  
Network Time Service  
One open access NTP server is available at address time.nmisa.org.  
More information is available at http://time.nmisa.org/
NMLS (1) Web-based time-of-day clock
A web clock is used to display the local time for Malaysia. The service is available at http://mst.sirim.my.

Network Time Service
The NTP time information is referenced to UTC(NMLS) and is currently generated by Stratum-1 NTP servers, made available to the public freely. The NTP server host names are ntp1.sirim.my and ntp2.sirim.my.

NPL Telephone Time Service
A TUG time code generator provides the European Telephone Time Code, referenced to UTC(NPL), by telephone modem. Software for synchronising computers is available from the NPL web site at www.npl.co.uk/time. The service telephone number is 020 8943 6333.

Internet Time Service
Two servers referenced to UTC(NPL) provide Network Time Protocol (NTP) time code across the internet. More information is available from the NPL web site at www.npl.co.uk/time. The server host names are: ntp1.npl.co.uk
ntp2.npl.co.uk

NPLI Web Clock
Web-based time-of-day clock that displays Indian Standard Time (IST) and UTC(NPLI). It also displays local time in user’s time zone, time-of-day of the user’s device clock and its difference. Available at the web page: http://www.nplindia.in/clockcode/html/index.php

Internet Time Service
Two servers referenced to UTC(NPLI) provide Network Time Protocol (NTP) time code across the internet. The server host names are:
time1.nplindia.org
time2.nplindia.org

NRC Telephone Code

Talking Clock Service
Voice announcements of Eastern Time are at ten-second intervals followed by a tone to indicate the exact time.

The service is available to the public in English at +1 613 745 1576 and in French at +1 613 745 9426. For more information see:
http://www.nrc-cnrc.gc.ca/eng/services/time/talking_clock.html

Web Clock Service
The Web Clock shows dynamic clocks in each Canadian Time zone, for both Standard time and daylight saving time. The web page is at:
http://www.nrc-cnrc.gc.ca/eng/services/time/web_clock.html

Short Wave Radio
CHU radio station broadcasts the time of day with voice announcements in English and French and time code at three different frequencies: 3.330 MHz, 7.850 MHz and 14.670 MHz. Further information at:
http://www.nrc-cnrc.gc.ca/eng/services/time/short_wave.html

(1) Information based on the Annual Report 2017, not confirmed by the Laboratory.
Network Time Protocol
Operates multiple time servers using the "Network Time Protocol" at different locations and on two networks. Host names: time.nrc.ca and time.chu.nrc.ca. Further information at:
http://www.nrc-cnrc.gc.ca/eng/services/time/network_time.html

The official website for the Frequency and Time group is:
http://www.nrc-cnrc.gc.ca/eng/services/time/index.html

The contact email is: MSS-SMTime@nrc-cnrc.gc.ca

NSC IM
Network Time Service.
National Science Center Institute of Metrology (Kharkiv, Ukraine) operates time server Stratum 1 using the “Network Time Protocol” (NTP).
Stratum-1 time server using the “Network Time Protocol” (NTP).
Free access.
ip 81.17.128.133
ip 81.17.128.182
The server host name is: http://www.metrology.kharkov.ua/

NTSC
Network Time Service (NTS)
NTSC operates a time server directly referenced to UTC(NTSC). Software for the synchronization of computer clocks is available on the NTSC Time and Frequency web page: http://www.ntsc.ac.cn/
Access Policy: free
Contact: Shaowu DONG (sdong@ntsc.ac.cn).

ONBA
Speaking clock access phone number 113 (only accessible in Argentina).
Hourly and half hourly radio-broadcast time signal.
Internet time service at web site http://www.hidro.gov.ar/observatorio/lahora.asp

ONRJ
Telephone Voice Announcer (55) 21 25806037.
Telephone Code (55) 21 2580677 provides digital time code at 300 bauds, 8 bits, no parity, 1 stop bit (Leitch CSD5300)

Internet Time Service at the address : 200.20.186.75 and 200.20.186.94
SNTP at port 123
Time/UDP at port 37
Time/TCP at port 37
Daytime/TCP at port 13

WEB-based Time Services:
1) A real-time clock aligned to UTC(ONRJ) and corrected for internet transmission delay.
Further information at: http://200.20.186.71/asp/relogio/horainicial.asp

Broadcast Brazilian legal time (UTC – 3 hours) announced by a voice starting with “Observatório Nacional” followed by the current time (hh:mm:ss) each ten seconds with a beep for each second with a 1KHz modulation during 5ms and a long beep with 1KHz modulation during 200ms at the 58, 59 and 00 seconds. The signal is transmitted every day of the year by the radio station PPE, whose signal is at 10 MHz with kind of modulation A3H and HF transmission power of 1 kW.
ORB
Network Time Service via NTP protocol
Hostname: ntp1.oma.be and ntp2.oma.be
Access policy: free
Synchronization to UTC(ORB)
Contact: ntp-as@oma.be
Information on the web pages
http://www.betime.be/

ORB provides a time dissemination via phone and modem to synchronize PC clocks on UTC(ORB). The system used is the Time Distribution System from TUG, which produces the telephone time code mostly used in Europe. The baud rate used is 1200. The access phone number is 32 (0) 2 373 03 20. The system is updated periodically with DUT1 and leap seconds.

PTB
Telephone Time Service
The coded time information is referenced to UTC(PTB) and generated by a TUG type time code generator using an ASCII-character code. The time protocols are sent in a common format, the "European Telephone Time Code". Access phone number: +49 531 51 20 38.

Internet Time Service
The PTB operates three time servers using the "Network Time Protocol" (NTP), see http://www.ptb.de/cms/en/ptb/fachabteilungen/abtq/fb-q4/ag-q42.html for details and explanations.

The hostnames of the servers:
ptbtime1.ptb.de
ptbtime2.ptb.de
ptbtime3.ptb.de

PTB also provides a secured NTP time service. This service applies NTP’s pre-shared key approach. It arose from PTB’s particular duty to provide a secured NTP service for the smart grid initiative of the German Federal Ministry of Economic Affairs and Energy. The service is restricted to authenticated access only.

The hostnames of the servers
ntpsmgw1.ptb.de
ntpsmgw2.ptb.de

RISE
The coded time information is referenced to UTC(SP) and generated by two TUG type time code generators using an ASCII-character code. The time protocols are sent in a common format, the "European Telephone Time Code". Access phone number: +46 33 41 57 83

The coded time information is referenced to UTC(SP) and generated by several NTP servers using the Network Time Protocol (NTP) for both IPv4 and IPv6. Access host names: ntp1.sptime.se, ntp2.sptime.se, ntp3.sptime.se and ntp4.sptime.se

Speaking Clock
The speaking clock service is operated by Telia AB in Sweden. The time announcement is referenced to UTC(SP) and disseminated from a computer-based system operated and maintained at SP. Access phone number: 90510 (only accessible in Sweden). Access phone number: +4633 90510 (from outside Sweden).

More information about these services are found on the web site www.sp.se

ROA
Telephone Code
The coded time information is referenced to UTC(ROA) and generated by a TUG type time code generator using an ASCII-character code. The time protocols are sent in a common format, the "European Telephone Time Code". Access phone number: +34 956 599 429
Network Time Protocol
More information is available from the ROA web site at www.roa.es
Host names of the servers:
hora.roa.es
minuto.roa.es

SG
Network Time Service (NeTS)
Transmit digital time code via the Internet using three protocols -
Operate one time server at domain name: nets.org.sg

Automated Computer Time Service (ACTS)
Transmit digital time code (NIST format) via telephone modem for setting time in
computers. The coded time information is referenced to UTC(SG).
Include provision for correcting telephone time delay.
Access phone number: +65  67799978.

SIQ (1)
Internet Time Service (Network Time Protocol)
One server referenced to UTC(SIQ) provides Network Time Protocol (NTP) time
code across the internet.
There is free access to the server for all users.
The server host names are:ntp.siq.si or time.siq.si
(two URL’s for the same server; IP: 194.249.234.70)

SL
Network Time Service
Computers connected to the Internet can be synchronized to UTC(SL)
For more information please visit http://www.sltime.org and
http://www.measurementsdept.gov.lk or contact through email;
adelec@measurementsdept.gov.lk.

TL
Speaking Clock Service
Traceable to UTC(TL). Broadcast through PSTN (Public Switching Telephone
Network) automatically and provides an accurate voice time signal to public
users. Local access phone number: 117.

The Computer Time Service
Provides ASCII time code by telephone modem for setting time in computers.
Access phone number: +886 3 4245117.

NTP Service
TL operates the network time service using the "Network Time Protocol" (NTP).
Host name of the server: time.stdtime.gov.tw, further information in

TP
Internet Time Service
UFE operates time servers directly referenced to UTC(TP).
Time information is accessible through Network Time Protocol (NTP).
Server host name: ntp2.ufe.cz
More information at http://www.ufe.cz/

UME
Network Time Service
UME operates an NTP server referenced to UTC(UME).
Server Host Name: time.ume.tubitak.gov.tr

(1) Information based on the Annual Report 2017, not confirmed by the Laboratory.
USNO
Telephone Voice Announcer +1 202 762-1401
Backup voice announcer: +1 719 567-6742

GPS via subframe 4 page 18 of the GPS broadcast navigation message

Web site for time and for data files: https://www.usno.navy.mil/USNO/time

Network Time Protocol (NTP) see
https://www.usno.navy.mil/USNO/time/ntp
for software and site closest to you.

VMI
Network Time Service
VMI operates one time server Stratum 1 using the Network Time Protocol (NTP). For information on access to the website, please contact phuongtv@vmi.gov.vn. The server host name is:
http://standardtime.vmi.gov.vn/ or IP: 113.160.59.166 port 123

VNIIFTRI
Internet Time Service
VNIIFTRI operates eight time servers Stratum 1 and one time server Stratum 2 using the “Network Time Protocol” (NTP).

The server host names are:
ntp1.vniiftri.ru (Stratum 1)
ntp2.vniiftri.ru (Stratum 1)
ntp3.vniiftri.ru (Stratum 1)
ntp4.vniiftri.ru (Stratum 1)
ntp1.niiftri.irkutsk.ru (Stratum 1)
ntp2. niiftri.irkutsk.ru (Stratum 1)
vniiftri.khv.ru (Stratum 1)
vniiftri2.khv.ru (Stratum 1)
ntp21.vniiftri.ru (Stratum 2).

VSL
Internet Time Service
VSL operates a time server directly referenced to UTC(VSL).
Time information is accessible through Network Time Protocol (NTP).
The URL for the NTP server is: ntp.vsl.nl