Quick Reference: Pre-Installation Requirements for Opsware SAS 6.5

This reference document is intended to quickly familiarize you with the basic requirements for installing Opsware SAS, including the supported operating systems and their required packages, supported versions of Oracle, network requirements, and time and locale requirements.

This document discusses the following topics:

- Hardware Requirements for Opsware Core Servers

- Supported Operating Systems

- Supported Versions of Oracle

- SAS Core Server Package Requirements

    - Solaris Requirements

    - Linux Requirements

- Network Requirements

    - Network Requirements Within a Facility

    - Open Ports

- Core Time Requirements

For more detailed documentation about any of these topics, see the *Opsware*® *SAS Planning and Installation Guide*.

Hardware Requirements for Opsware Core Servers

An Opsware core server is a computer running one or more Opsware core components. You can install all of the Opsware core components on a single server or you can distribute the components across multiple servers. This section describes the hardware requirements for Opsware core servers.

Disk Space Requirements

On each core server, the root directory must have at least 72 GB of hard disk space. Opsware components are installed in the `/opt/opsware` directory.

Table 1-1 lists the recommended disk space requirements for installing and running Opsware components. These sizes are recommended for the primary production data. Additional storage for backups should be calculated separately.

Table 1-1: Opsware Disk Space Requirements

OPSWARE COMPONENT DIRECTORY	RECOMMENDED DISK SPACE	REQUIREMENT ORIGIN
/etc/opt/opsware	50 MB	Configuration information for all Opsware core services. (Fixed disk usage)
/media*	15 GB	The media directory holds the OS installation media that is shared over NFS or CIFS. The initial size for this directory depends on the total size of all OS installation media sets that you plan on provisioning, such as Windows 2003 CD (700mb), Redhat AS3 CDs (2GB), and Suse 9 SP3 (10GB). The network OS install shares do not need to reside on Opsware core systems and are typically dispersed across multiple servers as the Opsware mesh grows. (Bounded disk usage that grows quickly in large increments)
/opt/opsware	15 GB	The base directory for all Opsware core services. (Fixed disk usage)

Table 1-1: Opsware Disk Space Requirements (continued)

OPSWARE COMPONENT DIRECTORY	RECOMMENDED DISK SPACE	REQUIREMENT ORIGIN
/u01/oradata*	20 GB	The Oracle tablespace directory that contains all model and job history information. Known sizes range from 5GB to 50GB of space, depending on the frequency and type of work, the amount of software and servers managed, and the garbage collection frequency settings. (Bounded disk usage that grows slowly in small increments)
/var/log/opsware	10 GB	The total log space used by all Opsware components. (Fixed disk usage)
/var/opt/opsware	10 GB	The total run space used by all Opsware components, including instances, pid files, lock files, and so on. (Fixed disk usage)
/var/opt/opsware/word*	80 GB	The total disk space used by software that is imported into Opsware. Theoretically, this is infinite disk usage depending on how much software you import. Initial size calculation is based on the total size of all packages and patches that you want managed by Opsware. Known sizes range from 10GB to 250GB.
/var/opt/opsware/ogfs/mnt	20 GB	The home directory for Global Shell enabled Opsware user accounts.

Opsware Core Scalability for Performance

You can scale the Opsware SAS core components vertically, by adding additional CPUs and memory, or horizontally, by distributing the components on multiple servers.

CPU Requirements

The CPU for core servers has the following requirements:

• Single-server: 4 dual-core CPUs (or equivalent)

• Multiple-server: 2 dual-core CPUs (or equivalent)

Memory Requirements

The memory for core servers has the following requirements:

• Single-server: 8 GB RAM (1 GB per CPU core)

• Multiple-server: 4 GB RAM (1 GB per CPU core)

Supported Operating Systems

Table 1-2 lists the platform-specific requirements for installing Opsware SAS.

Table 1-2: Opsware Core Supported Operating Systems

SUPPORTED OS FOR OPSWARE CORE	VERSION	ARCHITECTURE	OPSWARE COMPONENTS
Sun Solaris	Solaris 8	Sun SPARC	All components, *excluding* the Opsware Global File System Server (OGFS) component
Sun Solaris	Solaris 9	Sun SPARC	All components
Sun Solaris	Solaris 10	Sun SPARC, Niagara	All components
Red Hat Linux	Red Hat Enterprise Linux 4 AS	64 bit x86	All components
Red Hat Linux	Red Hat Enterprise Linux 3 AS	32 bit x86	All components

Supported Versions of Oracle

Support for the Model Repository (truth) is limited to certain versions of Oracle running on certain versions of operating systems. Table 1-3 lists the supported Oracle versions.

Table 1-3: Supported Oracle Versions for the Model Repository

ORACLE EDITION	ORACLE VERSION
Oracle Standard Edition	9.2.0.4 9.2.0.6 9.2.0.7 9.2.0.8 10.2.0.2
Oracle Standard Edition One	10.2.0.2
Oracle Enterprise Edition	9.2.0.4 9.2.0.6 9.2.0.7 9.2.0.8 10.2.0.2

SAS Core Server Package Requirements

Solaris Requirements

For Solaris, the Opsware core servers must meet the requirements listed in Table 1-4, Table 1-5, and Table 1-6.

Table 1-4: Packages Required for Solaris

REQUIRED PACKAGES FOR SOLARIS		
SUNWCreq (cluster)	SUNWeurf	SUNWeudiv
SUNWadmap	SUNWi2rf	SUNWeudlg
SUNWadmc	SUNWi4rf	SUNWeudmg
SUNWdoc	SUNWi5rf	SUNWeuezt
SUNWesu	SUNWi7rf	SUNWeuhed
SUNWman	SUNWi8rf	SUNWeuluf
SUNWmkcdS	SUNWi9rf	SUNWeulux
SUNWswmt	SUNWi13rf	SUNWeuodf
SUNWtoo	SUNWi15rf	SUNWeuxwe
SUNWtoox**	SUNWtxfnt	SUNWuiu8
SUNWadmfw	SUNWinttf	SUNWuiu8x
SUNWlibC	SUNW5xmft	SUNWulcf
SUNWlibCx**	SUNWcxmft	SUNWulcfx
SUNWinst	SUNWjxmft	SUNWulocf
SUNWucbt	SUNWkxmft	SUNWuxlcf
SUNWucbtx**	SUNWeu8df	SUNWuxlcx
SUNWscpu	SUNWeu8os	SUNWeudbd
SUNWscpux**	SUNWeu8ox	SUNWeudhs
SUNWtcsh	SUNWeudba	SUNWeusru
SUNWsacom	SUNWeudda	SUNWuium
SUNWntpr	SUNWeudhr	NSCPeu8cm
SUNWntpu	SUNWeudis	
SUNWarrf		

** These packages are required only for Solaris 8 and Solaris 9.

Table 1-5: Packages Recommended for Solaris

RECOMMENDED PACKAGES FOR SOLARIS		
SUNWisolc	SUNWjiu8	SUNWkiu8x
SUNWisolx	SUNWkiu8	SUNWtiu8x
SUNWislcc	SUNWtiu8	SUNWi1of
SUNWislcx	SUNWciu8x	SUNWiniu8
SUNWciu8	SUNWhiu8x	SUNWiniu8x
SUNWhiu8	SUNWjiu8x	

Table 1-6: Packages That Must Be Removed for Solaris

PACKAGES THAT MUST BE REMOVED FROM SOLARIS
SUNWCpm

Other Solaris Requirements

For Solaris, the Opsware core servers must also meet the following requirements:

- On the server where you will install the SAS Web Client component, you must install the J2SE Cluster Patches for Solaris. To download these patches, search for "J2SE Cluster Patches" for your version of Solaris at `http://www.sun.com/`.

- On all core servers, verify that the Network File System (NFS) is configured and running.

- For Daylight Saving Time (DST) on Solaris 9 servers, you must install the time zone patch 113225-07 or later, and libc patch 112874-33 or later. To download these patches, search for the patch ID at `http://www.sun.com/`.

- For Daylight Saving Time (DST) on Solaris 10 servers, you must install the time zone patch 122032-03 or later, and libc patch 119689-07 or later. To download these patches, search for the patch ID at `http://www.sun.com/`.

   For more information about DST changes, search for "Daylight Saving Time (DST)" at `http://www.sun.com/`.

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Linux Requirements

For Linux, the Opsware core servers must meet the requirements listed in Table 1-7, Table 1-8, and Table 1-9.

Table 1-7: Packages Required for Linux AS3 32-bit x86

REQUIRED PACKAGES FOR LINUX AS3 32-BIT X86		
at	iptables	patch
compat-db	kernel-source	patchutils
compat-libstdc++	libcap	sharutils
coreutils	libxml2-python	strace
cpp	libstdc++	tcl
expat	libstdc++-devel	unzip
gcc	mkisofs	XFree86-libs
glibc-devel	ncompress (contains	XFree86-libs-data
glibc-headers	uncompress utility)	XFree86-Mesa-libGL
glibc-kernheaders	nfs-utils	xinetd
	ntp	zip

Table 1-8: Packages Required for Linux AS4 64-bit x86

REQUIRED PACKAGES FOR LINUX AS4 64-BIT X86
binutils-2.15.92.0.2-21.x86_64.rpm
chkfontpath-1.10.0-2.x86_64.rpm
compat-db-4.1.25-9.i386.rpm
compat-db-4.1.25-9.x86_64.rpm
compat-libstdc++-33-3.2.3-47.3.i386.rpm
compat-libstdc++-33-3.2.3-47.3.x86_64.rpm
control-center-2.8.0-12.rhel4.5.x86_64.rpm
cpp-3.4.6-3.x86_64.rpm
desktop-file-utils-0.9-2.x86_64.rpm
expat-1.95.7-4.i386.rpm
expat-1.95.7-4.x86_64.rpm
expat-devel-1.95.7-4.x86_64.rpm
gamin-0.1.1-4.EL4.i386.rpm
gamin-0.1.1-4.EL4.x86_64.rpm
gamin-devel-0.1.1-4.EL4.x86_64.rpm
gamin-python-0.1.1-4.EL4.x86_64.rpm
gamin-devel-0.1.1-4.EL4.x86_64.rpm
gcc-3.4.6-3.x86_64.rpm
gcc-c++-3.4.6-3.x86_64.rpm
gcc-g77-3.4.6-3.x86_64.rpm
gcc-gnat-3.4.6-3.x86_64.rpm
gcc-java-3.4.6-3.x86_64.rpm
gcc-objc-3.4.6-3.x86_64.rpm
gcc4-4.1.0-18.EL4.x86_64.rpm
gcc4-c++-4.1.0-18.EL4.x86_64.rpm
gcc4-gfortran-4.1.0-18.EL4.x86_64.rpm
gcc4-java-4.1.0-18.EL4.x86_64.rpm
gcc-c++-3.4.6-3.x86_64.rpm
glibc-2.3.4-2.25.i686.rpm
glibc-2.3.4-2.25.x86_64.rpm
glibc-common-2.3.4-2.25.x86_64.rpm
glibc-devel-2.3.4-2.25.i386.rpm
glibc-devel-2.3.4-2.25.x86_64.rpm
glibc-headers-2.3.4-2.25.x86_64.rpm
glibc-kernheaders-2.4-9.1.98.EL.x86_64.rpm

Table 1-8: Packages Required for Linux AS4 64-bit x86 (continued)

REQUIRED PACKAGES FOR LINUX AS4 64-BIT X86
glibc-profile-2.3.4-2.25.x86_64.rpm
glibc-utils-2.3.4-2.25.x86_64.rpm
glibc-common-2.3.4-2.25.x86_64.rpm
glibc-devel-2.3.4-2.25.i386.rpm
glibc-devel-2.3.4-2.25.x86_64.rpm
glibc-headers-2.3.4-2.25.x86_64.rpm
glibc-kernheaders-2.4-9.1.98.EL.x86_64.rpm
gnome-libs-1.4.1.2.90-44.1.x86_64.rpm
gnome-libs-devel-1.4.1.2.90-44.1.x86_64.rpm
kernel-smp-2.6.9-55.EL.x86_64.rpm
kernel-smp-devel-2.6.9-55.EL.x86_64.rpm
libaio-0.3.105-2.i386.rpm
libaio-0.3.105-2.x86_64.rpm
libaio-devel-0.3.105-2.x86_64.rpm
libcap-1.10-20.i386.rpm
libcap-1.10-20.x86_64.rpm
libcap-devel-1.10-20.x86_64.rpm
libgcc-3.4.6-3.i386.rpm
libgcc-3.4.6-3.x86_64.rpm
libpng-1.2.7-1.el4.2.i386.rpm
libpng-1.2.7-1.el4.2.x86_64.rpm
libpng-devel-1.2.7-1.el4.2.x86_64.rpm
libpng10-1.0.16-1.i386.rpm
libpng10-1.0.16-1.x86_64.rpm
libpng10-devel-1.0.16-1.x86_64.rpm
libstdc++-3.4.6-3.i386.rpm
libstdc++-3.4.6-3.x86_64.rpm
libstdc++-devel-3.4.6-3.i386.rpm
libstdc++-devel-3.4.6-3.x86_64.rpm
libstdc++-devel-3.4.6-3.i386.rpm
libstdc++-devel-3.4.6-3.x86_64.rpm
libtermcap-2.0.8-39.i386.rpm
libtermcap-2.0.8-39.x86_64.rpm

Table 1-8: Packages Required for Linux AS4 64-bit x86 (continued)

REQUIRED PACKAGES FOR LINUX AS4 64-BIT X86
libtermcap-devel-2.0.8-39.x86_64.rpm
libxml2-2.6.16-6.i386.rpm
libxml2-2.6.16-6.x86_64.rpm
libxml2-devel-2.6.16-6.x86_64.rpm
libxml2-python-2.6.16-6.x86_64.rpm
make-3.80-6.EL4.x86_64.rpm
mkisofs-2.01.1-5.x86_64.rpm
ncompress-4.2.4-41.rhel4.x86_64.rpm
nfs-utils-1.0.6-70.EL4.x86_64.rpm
nfs-utils-lib-1.0.6-3.x86_64.rpm
nfs-utils-lib-devel-1.0.6-3.x86_64.rpm
ntp-4.2.0.a.20040617-4.EL4.1.x86_64.rpm
openmotif21-2.1.30-11.RHEL4.6.i386.rpm
patch-2.5.4-20.x86_64.rpm
patchutils-0.2.30-1.x86_64.rpm
pdksh-5.2.14-30.3.x86_64.rpm
popt-1.9.1-18_nonptl.i386.rpm
popt-1.9.1-18_nonptl.x86_64.rpm
readline-4.3-13.i386.rpm
readline-4.3-13.x86_64.rpm
readline-devel-4.3-13.x86_64.rpm
rpm-build-4.3.3-18_nonptl.x86_64.rpm
screen-4.0.2-5.x86_64.rpm
sharutils-4.2.1-22.2.x86_64.rpm
strace-4.5.14-0.EL4.1.x86_64.rpm
switchdesk-4.0.6-3.noarch.rpm
switchdesk-gui-4.0.6-3.noarch.rpm
sysstat-5.0.5-11.rhel4.x86_64.rpm
tcl-8.4.7-2.i386.rpm
tcl-8.4.7-2.x86_64.rpm
tcl-devel-8.4.7-2.x86_64.rpm
tcl-html-8.4.7-2.x86_64.rpm
tclx-8.3.5-4.i386.rpm
tclx-8.3.5-4.x86_64.rpm
tclx-devel-8.3.5-4.x86_64.rpm

Table 1-8: Packages Required for Linux AS4 64-bit x86 (continued)

REQUIRED PACKAGES FOR LINUX AS4 64-BIT X86
tclx-doc-8.3.5-4.x86_64.rpm
tcp_wrappers-7.6-37.2.i386.rpm
tcp_wrappers-7.6-37.2.x86_64.rpm
ttmkfdir-3.0.9-14.1.EL.x86_64.rpm
unzip-5.51-7.x86_64.rpm
vim-enhanced-6.3.046-0.40E.7.x86_64.rpm
vnc-4.0-8.1.x86_64.rpm
vnc-server-4.0-8.1.x86_64.rpm
xinetd-2.3.13-4.4E.1.x86_64.rpm
xinitrc-4.0.14.3-1.noarch.rpm
xorg-x11-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-Mesa-libGL-6.8.2-1.EL.13.36.i386.rpm
xorg-x11-Mesa-libGL-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-Mesa-libGLU-6.8.2-1.EL.13.36.i386.rpm
xorg-x11-Mesa-libGLU-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-Xdmx-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-Xnest-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-Xvfb-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-deprecated-libs-6.8.2-1.EL.13.36.i386.rpm
xorg-x11-deprecated-libs-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-deprecated-libs-devel-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-devel-6.8.2-1.EL.13.36.i386.rpm
xorg-x11-devel-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-doc-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-font-utils-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-libs-6.8.2-1.EL.13.36.i386.rpm
xorg-x11-libs-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-sdk-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-tools-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-twm-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-xauth-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-xdm-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-xfs-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-Mesa-libGL-6.8.2-1.EL.13.36.i386.rpm

Table 1-8: Packages Required for Linux AS4 64-bit x86 (continued)

REQUIRED PACKAGES FOR LINUX AS4 64-BIT X86
xorg-x11-Mesa-libGL-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-Mesa-libGLU-6.8.2-1.EL.13.36.i386.rpm
xorg-x11-Mesa-libGLU-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-Xvfb-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-deprecated-libs-6.8.2-1.EL.13.36.i386.rpm
xorg-x11-deprecated-libs-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-deprecated-libs-devel-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-font-utils-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-libs-6.8.2-1.EL.13.36.i386.rpm
xorg-x11-libs-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-twm-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-xauth-6.8.2-1.EL.13.36.x86_64.rpm
xorg-x11-xfs-6.8.2-1.EL.13.36.x86_64.rpm
xscreensaver-4.18-5.rhel4.11.x86_64.rpm
xterm-192-4.EL4.x86_64.rpm
zip-2.3-27.x86_64.rpm
zlib-1.2.1.2-1.2.i386.rpm
zlib-1.2.1.2-1.2.x86_64.rpm
zlib-devel-1.2.1.2-1.2.i386.rpm
zlib-devel-1.2.1.2-1.2.x86_64.rpm

Table 1-9: Packages That Must Be Removed for Linux

PACKAGES THAT MUST BE REMOVED FROM LINUX		
samba	rsync	tftp
apache	httpd	dhcp

Network Requirements

This section discusses the following network requirements within a facility, open ports required for core components, and name resolution requirements. These requirements must be met for both standalone and multimaster cores.

Network Requirements Within a Facility

Before running the Opsware Installer, your environment must meet the following network requirements:

• The Opsware core servers must be on the same Local Area Network (LAN or VLAN).

• The Opsware core servers must have network connectivity to the servers that the Opsware core manages, and vice versa.

• The Opsware core servers cannot use the Network Information Service (NIS) for password and group databases. The Opsware components check for the existence of certain target accounts before creating them during installation.

• When using network storage for Opsware components, such as the Software Repository or Media Server, the network storage configuration must allow the root user to have write access over NFS to the directories where the components are to be installed.

• The speed and duplex mode of the NIC adapters of the Opsware core and managed servers must match the switch they are connected to. A mismatch causes poor network performance between the core and managed servers, making Opsware SAS unusable.

Open Ports

Table 1-10 shows the ports that must be open on firewalls that protect the Opsware core components. The Gateway ports listed are the default values, which can be changed during the installation.

Table 1-10: Open Ports on a Firewall Protecting an Opsware Core

PORT	COMPONENT	PURPOSE
80 (TCP)	Opsware Command Center	HTTP redirector
443 (TCP)	Opsware Command Center	HTTPS Proxy for SAS Web Client UI, SAS Client, Opsware Web Services (2.2)

Table 1-10: Open Ports on a Firewall Protecting an Opsware Core (continued)

PORT	COMPONENT	PURPOSE
2001 (TCP)	Core Gateway	Inbound tunnels from other Gateways
2222 (TCP)	Opsware Global File System	Global shell session from an SSH client
3001 (TCP)	Agent Gateway	Inbound Agent connections
7580, 7581 (TCP)	Model Repository Multimaster Component	TIBCO Rendezvous web client
8017 (UDP, TCP)	Agent Gateway	Interface to the Build Manager
8080 (TCP)	Opsware Command Center	Load Balancing Gateway for the SAS Client

Table 1-11 shows the ports for the OS provisioning components that are accessed by servers during the provisioning process. (In Opsware SAS, provisioning refers to the installation of an operating system on a server.)

Table 1-11: Open Ports for the OS Provisioning Components

PORT	COMPONENT	SERVICE
67 (UDP)	Boot Server	DHCP
69 (UDP)	Boot Server	TFTP
111 (UDP, TCP)	Boot Server, Media Server	RPC (`portmapper`), required for NFS
Dynamic*	Boot Server, Media Server	`rpc.mountd`, required for NFS
2049 (UDP, TCP)	Boot Server, Media Server	NFS

* The `rpc.mountd` process runs on a dynamic port and is not fixed. Therefore, if a firewall is in place, it must be an application layer firewall that can understand the RPC request that the client uses to locate the port for `mountd`. The firewall must dynamically open that port.

Table 1-12 shows the ports that must be open on managed servers so that Opsware core servers can connect to managed servers.

Table 1-12: Open Ports on Managed Servers

PORT	COMPONENT
1002 (TCP)	Opsware Agent

DHCP Proxying

If network provisioning occurs on a separate network from the Opsware core components, you must set up DHCP proxying (for example, with Cisco IP Helper) to the DHCP server. If you set up DHCP proxying, the server/router performing the DHCP proxying must be the router for the network so that PXE will function correctly in the Opsware OS Provisioning Feature.

The Opsware Boot Server component includes a DHCP server, but does not include a DHCP proxy. You configure the DHCP server after installation by using the Opsware DHCP Network Configuration Tool.

DMZ Network

The Boot Server and Media Server run various services (such as portmapper and rpc.mountd) that have been susceptible to network attacks. Opsware Inc. recommends that you segregrate the OS Provisioning Boot Server and Media Server components onto their own DMZ network. When you segregate these components, the ports listed previously) should be opened to the DMZ network from the installation client network. Additionally, the Boot Server and Media Server should have all vendor-recommended security patches applied.

Core Time Requirements

Opsware core servers (either standalone or multimaster) and Opsware Satellite servers must meet the following requirements. These time requirements do not apply to managed servers (that is, servers with Opsware Agents).

• Opsware core servers must maintain synchronized clocks. For example, you can synchronize the system clocks with an external server that uses NTP (Network Time Protocol) services.

- Opsware core servers must have their time zone set to Coordinated Universal Time (UTC).

On Linux servers, to configure the time zone, perform the following steps:

- Copy or link `/usr/share/zoneinfo/UTC` to `/etc/localtime`.

- Make sure that `/etc/sysconfig/clock` contains the following lines:

```
ZONE="UTC"
UTC=true
```

On Solaris servers, to configure the time zone, verify that `/etc/TIMEZONE` contains the following line: TZ=UTC