Lucent Technologies
Bell Labs Innovations

INTUITY™ CONVERSANT® System
Version 7.0
Year 2000 Compliance

Contents

Year 2000 Compliance

Overview

The purpose of this document is to inform the customer of the areas that are affected by year 2000 issues and provide guidelines to help establish year 2000 compliance.

This document provides the following information:

- Definition of year 2000 compliance — A general description of year 2000 compliance, including the address for the World Wide Web site for Lucent Business Communications Systems (BCS) where you can view the BCS definition of compliance. Also included is a summary of customer responsibilities for ensuring year 2000 compliance.

- Guidelines for reviewing your applications — A checklist of suggested areas to investigate in your applications when reviewing them for year 2000 compliance.

- Notes on developing applications that are year 2000 compliant — Recommendations to follow to keep your applications year 2000 compliant.

- Areas requiring additional consideration — Descriptions of additional areas of your system that you should be aware of when preparing your system for year 2000 compliancy. Some areas are merely conditions you should note, and others are areas that have been fixed by remote-field updates. In some cases, alternative actions are provided.

■ Information for advanced users — An appendix containing testing guidelines, should you choose to test your own applications, and information about database records with time fields.

Disclaimer: We have attempted in this book to provide an exhaustive list of items affected by the year 2000. However, we may have overlooked other areas. If you identify any such areas, contact the remote maintenance center to report the problem. Lucent Technologies makes no representation or warranty that this version or any other version of the INTUITY CONVERSANT system is entirely year 2000 compliant.

About Year 2000 Compliance

When the date changes from the 20th century (19xx) to the 21st (20xx), INTUITY CONVERSANT features that contain or handle two-digit calendar years, such as reports and call data records, can function in atypical ways. Also, INTUITY CONVERSANT applications that process data containing dates from the 21st century might require modifications in order to ensure that calendar years are handled correctly. "Year 2000 compliance" is the process of updating and modifying your system so that it handles 21st-century calendar years accurately.

Lucent BCS Internet Web Site

For the most current information about year 2000 issues and Lucent Business Communications Systems (BCS) products, see our World Wide Web site at **www.lucent.com/enterprise/sig/yr2000** (or, from the Lucent Technologies home page of www.lucent.com, click on Enterprise, then Year 2000).

At this site, you can view the complete Lucent BCS definition of compliance. To view compliance information for your CONVERSANT product, click on BCS Product Compliance Status, then click on Voice Response.

Summary of Customer Responsibilities

The following list summarizes the steps that customers are responsible for taking to make their INTUITY CONVERSANT V7.0 system year 2000 compliant. More detailed instructions or guidelines for each step are included in this document. The most time-consuming step is that of reviewing your applications for non-compliant behavior. If areas of non-compliancy are found and modifications are needed, these changes are usually minor and easy to fix.

1. Read through this document to ensure that you understand all areas that apply to your system for year 2000 compliance.

2. Ensure that all existing applications are year 2000 compliant, which includes the following tasks:

- Assess your resources: For example, determine if you have applications that were developed by an outside vendor, or if you have the in-house expertise to review your applications.

- Familiarize yourself with the areas affected by year 2000.

- Determine which applications need to be reviewed. It is likely that any application using two-digit years will need to be modified.

- Review, modify if necessary, and test the appropriate applications. Note that Lucent Technologies *strongly recommends* that you contract with a software provider to test your applications.

3. Ensure that applications developed now and in the future are year 2000 compliant.

4. Familiarize yourself with all remaining areas that might behave differently concerning calendar dates.

> **NOTE:**
> If you use Voice@Work, you must ensure that the personal computer on which it is loaded is year 2000 compliant.

Guidelines for Reviewing Your Applications

All INTUITY CONVERSANT applications should be evaluated for year 2000 issues. This section provides guidelines to help you review your applications and is organized into the following areas:

1. Assess your resources.

2. Familiarize yourself with the areas affected by year 2000.

3. Determine which applications need to be reviewed. It is likely that any applications using two-digit years will need to be modified.

4. Review, modify, and test the appropriate applications.

> **NOTE:**
> Lucent Technologies *strongly recommends* that you contract with a software provider to test your applications. If you do choose to test your applications yourself, be sure that you test on a non-production machine. For further information, see "Guidelines for Testing Your Applications" in Appendix A, "For Advanced Users".

Assess Your Resources

Before you begin modifying your applications, determine the following and estimate any possible costs:

- Was your application developed in-house? If you contracted with an outside vendor, contact the vendor to discuss year 2000 compliance for the application. If you contracted with Lucent Technologies, contact your Lucent Technologies Account Representative.

- Do you have the expertise in-house to review your applications for compliance? If you do not, contact your Lucent Technologies Account Representative for help in connecting you to a software provider.

- Does the application source code reside in-house, or did a software vendor provide the object code only? If a software vendor retained the source code, contact the vendor to discuss year 2000 compliance for the application.

- Do you have the software or tools to make the necessary changes (Script Builder, Voice@Work, or a development tool such as Pro*C)? If not, then contact the application developer who wrote the application.

Familiarize Yourself with Areas Affected

Thoroughly review the sections "Developing Compliant Applications" on page 6 and "Areas Requiring Additional Consideration" on page 12. These sections describe areas that are affected by the year 2000 and provide preventative or alternative actions that might be required.

Determine the Applications to Be Reviewed

Examine your applications to determine which ones will be affected by year 2000 issues. Of these applications, determine when the data is affected—some applications may be affected well before January 1, 2000. You can use the following general guidelines to help determine the applications that need to be reviewed:

1. Determine all applications that have date-related information that is collected, stored, manipulated, spoken, recognized, or reported. If an application does not in any way handle date-related information, it might not need to be reviewed.

2. Determine if the data used by an application will span into the 21st century (years 2000-2999). If so, when? For example, if you ask callers to input their credit card expiration date, is that date already in the 21st century? If yes, your application may already be affected. If your data always remains in the current year, your solution may not be affected until the year 2000. Be aware that some applications can be affected in the last hours of December 31, 1999, or the first hours of January 1, 2000 (see "Areas Requiring Additional Consideration" on page 12).

3. Determine if you have any applications that will be replaced prior to year 2000 and that do not handle date-related information involving years in the 21st century. These applications might not need to be reviewed.

➡ **NOTE:**
It is best to review all applications thoroughly unless you are certain that an application will not be affected.

Review, Modify, and Test Your Applications

In most cases, the most time-consuming portion of making your system year 2000 compliant involves reviewing your applications for non-compliant behavior. If areas are found, they usually require only minor changes to become compliant, such as replacing a hard-coded "19xx" with something more appropriate. Each application that is modified must be tested thoroughly to make sure it operates correctly.

➡ **NOTE:**
Lucent Technologies *strongly recommends* that you work with a software provider to test your applications. However, if you choose to do this work yourself, refer to the section "Guidelines for Testing Your Applications" in Appendix A, "For Advanced Users".

Review Checklist

Use the checklist below as a guide in reviewing your voice response solution for year 2000 compliance. The list describes areas to investigate for year 2000 compliance, but it is not intended to be exhaustive. Each customer may have unique year 2000 compliances issues based on the current configuration and applications. Areas to examine include:

■ Applications that assume "19xx" when collecting, storing, manipulating, or speaking years.

■ Date-related information that uses two-digit years (such as 98, 99, 00). In most cases, using a four-digit year ensures fewer errors are made in manipulating, comparing, storing, or speaking the year. Note that changing your application to accept four-digit years might require re-recording the prompts that ask callers for this data.

■ Applications that manipulate dates (for example, calculating age, expiration date, and so on). Test to ensure correct operation when the dates involved span the 20th and 21st centuries, and when in the 21st century.

■ Custom written shell scripts or data interface processes (DIPs) that accept or display date-related information, such as a custom call data report that accepts a date as input. Test to ensure that years beyond 1999 are accepted and output correctly.

- Custom cron (automatically scheduled) jobs. Test to ensure execution beyond the 20th century.

- Host database records. The application developer must review the host data field formats and determine if any changes are needed. For example, an application might benefit from using the new YT<*threshold*> format described in the section "Use New Formats for Script Builder Host Input date Fields" on page 7.

- Host databases that contain records using a two-digit year, and the century is context dependent. The application developer must include some post processing after the year is retrieved and translated by the host DIP.

- Applications that use spoken dates (specifically with a two-digit year). Test to ensure that end customers find acceptable the spoken format for years beyond 1999. For details on spoken formats, see "Formats for Speaking Dates" on page 19.

Customized Applications

Almost every INTUITY CONVERSANT system has some type of customized application loaded. This application may include scripts, custom menus, custom reports, and so forth. Because of the unique nature of each custom application, year 2000 compliance for many custom components falls outside the responsibility of Lucent Technologies. You are, therefore, responsible for ensuring that your INTUITY CONVERSANT custom applications can continue to operate through the year 2000. Lucent Technologies strongly recommends that you work with a software provider to test these applications.

Developing Compliant Applications

This section provides information on the following topics to help you construct applications that are year 2000 compliant:

- Use four-digit years whenever possible

- Use new formats for Script Builder date fields for host input

- Adapt your method for processing dates later than the year 2038

Use Four-Digit Years

When modifying existing applications and developing new ones, always use four-digit years whenever possible. Using four-digit years eliminates the issues surrounding system interpretation of the century for two-digit years. If you must continue to use two-digit years, be sure and read carefully the information in this section and in the section "Areas Requiring Additional Consideration" on page 12.

Two-Digit Years in date Fields in
Script Builder Database Tables

If you are using Script Builder or Voice@Work to manually edit a date field in a database table, always use a four-digit year. In a database table, INTUITY CONVERSANT stores dates in a *CCYYMMDD* format (*century year month day*). If an application inserts a date field with a two-digit year instead of a four-digit year, the system appends the current century to the value. Your applications can be affected by this operation if your date data spans both the 20th and 21st centuries. For example, if the current date is 1999, a two-digit year such as 02 (for 2002) will have "19" appended to it, thereby becoming 1902 instead of 2002. You can avoid such cases by ensuring that your application provides a four-digit year.

Use New Formats for Script Builder
Host Input date Fields

The INTUITY CONVERSANT System Version 7 provides formats for host date fields to accommodate dates in the 21st century, as well as a host date field for two-digit years that supports a range of 100 years (YT<*threshold*>). You now have the following three formats to use to designate a year for a host date field:

- Y — Indicates a two-digit year in the *current* century on the host.

- YY — Indicates a four-digit year on the host.

- YT<*threshold*> — Use this format when an application is receiving a two-digit year from an IBM host. You define a threshold that determines which century is assigned. See the next section for details.

The YT<*threshold*> Format

The YT<*threshold*> format allows you to specify a threshold from 0 through 100 to use when applications receive two-digit years from an IBM host. With this format, the two-digit year input (*yy*) received from the host will be placed into a 100-year time period that you define when you specify the threshold. (For example, a threshold of 50 defines the 100-year span as 1950 through 2049.) If the input year *yy* is equal to or greater than the specified threshold, the year is translated to 19*yy*. If the year *yy* is less than the specified threshold, the year is translated to 20*yy*.

To determine an appropriate threshold, analyze the range of dates required per date field from the host. For example, if the range of dates falls between 1940 and 2039, use a threshold of 40 (YT40). If the format is YT40 and an input year from the host is 45 (equal to or greater than 40), the year is translated into 1945. If the input year from the host is 37 (less than 40), the year is translated into 2037.

For a 100-year span of 1900 through 1999, use the format YT0; for the years 2000 through 2099, use YT100.

This threshold is defined in the host screen definition field for the application. See "Defining Screen Fields" in *INTUITY CONVERSANT System Version 7.0 Application Development with Script Builder*, 585-313-206, for instructions on how to define host screen definition fields and for detailed information on defining host input date fields.

Available Formats

Table 1 shows some examples of formats that are now available for you to use when defining host input into a date field. Note that although most of the examples below use the order of *month day year*, the formats support other sequences, such as *year month day*.

⇒ **NOTE:**
In many of the formats given below, two-digit years assume the current century, meaning that either "19" or "20" is appended, according to whether the current century is 19*xx* or 20*xx*. For example, 11/23/05 is interpreted as November 23, 2005, when the current century is the 21st. However, if the current century is the 20th century (19*xx*), the system will interpret 11/23/05 to be 1905.

Table 1. Examples of Host Input into a *date* Field

Format	Description
D	Date in *month day year* format, regardless of the separators used. The month is by digit or name and the year can be in two or four digits, with two-digit years assuming the current century.
DM/D/Y	Date in *month/day/year* format with *year* in the current century, such as 11/23/98, 01/02/01, or 1/2/01 (default) with slashes (/) as separators.
DM-D-Y	Date in *month-date-year* format with *year* in the current century, such as 11-23-98, 01-02-01, or 1-1-01 (default) with hyphens (-) as separators.
DM.D.Y	Date in *month.date.year* format with *year* in the current century, such as 11.23.98, 01.02.01, or 1.2.01 (default) with periods (.) as separators.
DM/D/YY	Date in *month/date/year* format, such as 11/23/1998 or 01/02/2001, with slashes (/) as separators.
DMBD,BYY	Date in *month date, year* format, such as November 23, 1998, or January 2, 2001.
DYY.M.D	Date in four-digit *year.month.day* format with periods (.) as separators, such as 1998.11.23 or 2001.1.2

Table 1.   Examples of Host Input into a *date* Field — *Continued*

Format	Description
DM/D/YT<*threshold*>	Date in *month/day/year* format with slashes (/) as separators, such as 02/25/98 or 11/17/01. The threshold is defined in the host field definition and then compared to the input from the host to determine if the century is "19" or "20".
DM-D-YT<*threshold*>	Date in *month-day-year* format with hyphens (-) as separators, such as 10-05-97 or 02-27-05. The threshold is defined in the host field definition and then compared to the input from the host to determine if the century is "19" or "20".
DYT<*threshold*>.M.D	Date in *year.month.day* format with periods (.) as separators, such as 99.10.03 or 01.10.03. The threshold is defined in the host field definition and then compared to the input from the host to determine if the century is "19" or "20". For example, DYT50.M.D uses a threshold of 50 to indicate the 100-year span of 1950 through 2049.

Adapt Date-Processing Methods for Year 2038

The UnixWare v2.1 operating system supports dates between January 1, 00:00:00, 1970 Greenwich Mean Time (GMT), and January 19, 03:14:07, 2038 GMT, as shown in Table 2. (GMT is a standard method of measuring time on a 24-hour clock.) If you use UnixWare v2.1 functions to process date data, dates cannot exceed January 19, 03:14:07, 2038 GMT. Your CONVERSANT application can, however, process dates past this date if you switch to the methods described in .

Table 2.   Range Supported by UnixWare v2.1 Operating System

Earliest date supported	Last date supported
January 1, 00:00:00 1970 (GMT)	January 19, 03:14:07 2038 (GMT)

How UnixWare v2.1 Calculates Time

The UnixWare v2.1 operating system calculates the current time based on the starting point of January 1, 00:00:00, 1970 GMT (referred to as the *Epoch*). To determine the current day, the UnixWare v2.1 operating system keeps track of the number of seconds that have occurred since the Epoch in a data type *time_t*, which is defined with a 32-bit internal date representation.

Because the data type *time_t* is based on a signed 32-bit value, the maximum date that UnixWare v2.1 can represent is January 19, 03:14:07, 2038 GMT. You can set the UnixWare v2.1 operating system date to any point in this range and have accurate results regarding the system day and time. However, you cannot use UnixWare v2.1 functions to process dates exceeding the last supported date of January 19, 03:14:07, 2038 GMT.

Script Builder Example

The Script Builder *datetime_u* and *u_datetime* external functions are used to process dates and could be involved in processing values that exceed the last date supported by UnixWare 2.1. These external functions do not work if the date converts to a UnixWare v2.1 time that is greater than this value.

For example, in an application that requires adding 30 days to a date, CONVERSANT Script Builder application developers might have used the *datetime_u* and *u_datetime* functions to handle date arithmetic as follows:

1. The *datetime_u* function converts the date (in *CCYYMMDD* format) and time (in *HHMMSS* format) to the UnixWare v2.1 representation of time as the number of seconds since the Epoch.

2. Thirty days is added by multiplying 30 times the number of seconds in a day and adding that value to the UnixWare v2.1 time.

3. The *u_datetime* function converts the UnixWare v2.1 time (in seconds since the Epoch) back to a regular date (in *CCYYMMDD* format) and time (in *HHMMSS* format).

If the value achieved in step1 or step 2 is greater than the value for January 19, 03:14:07 2038 GMT, the *datetime_u* and *u_datetime* functions will not work.

Voice@Work Example

The Voice@Work Set and Test node allows you to perform date arithmetic by creating branches. You can, for example, create a branch to add or subtract a number of days from a given date. Like the Script Builder functions described above, the Set and Test node converts the date to a UnixWare v2.1 representation of time as the number of seconds occurring since the Epoch. The node then adds or subtracts the appropriate number of seconds before converting the value back to a date. Node branches that handle values exceeding the value for January 19, 03:14:07 2038 GMT will not work.

➡ **NOTE:**
Be aware that the simulation feature in Voice@Work *appears* to correctly handle date values that exceed January 19, 03:14:07 2038. However, the simulation feature does not recognize if a date value in a Set and Test node exceeds this last supported date. Keep in mind that even though the node branches appear to work correctly in the simulation, they do not work correctly on the actual CONVERSANT system.

Alternative Methods

If your application must process dates beyond the last date supported by UnixWare v2.1, you can use the following alternatives:

- Use the ORACLE database. This database has many date functions that can be accessed by writing a C-language data interface process (DIP). CONVERSANT can call this DIP to handle date arithmetic. Some ORACLE date functions are listed below. See the ORACLE documentation for more information on date functions.

  — ADD_MONTHS — to add some number of months to a given date

  — LAST_DAY — to compute the last day of the given month

  — MONTHS_BETWEEN — to compute the number of months between two given dates

  — NEW_TIME — to compute the date and time in a different time zone

  — NEXT_DAY — to compute the first day of the week that is equal to or later than a given day

- Use your own date processing functions to manipulate dates and handle any date arithmetic needed by your applications. Ensure that the functions correctly handle calculations involving leap years, if appropriate.

Areas Requiring Additional Consideration

This section describes additional areas of your CONVERSANT system that you should be aware of when preparing for year 2000 compliancy. These areas are minor and should not affect customer applications. Some areas are merely conditions you should note, and others are areas that have been fixed by remote-field update. Alternative actions are provided in some cases.

Table 3 gives a summary of the areas described and references the section that describes each area in more detail. If the area has been fixed in a remote-field update (RFU) or patch, it is noted in the Status/Action column. Remote-field updates and patches are delivered via a Quality Protection Process Change Notice (QPPCN). For instructions on how to determine if these updates have been installed on your system, see "Determining If the Updates Are Installed" on page 13.

Table 3. Summary of Areas Requiring Additional Consideration

Area	Status/Action
Time Zone Differences on 12/31/1999 and 1/1/2000 (page -14): On 12/31/1999 and 01/01/2000, some applications could assume the wrong century because of time-zone differences with Greenwich Mean Time (GMT).	Be aware of situation.
Datakit and uucico Command (page -16): If you have Datakit connections, the Commkit package overwrites files such as uucico.	Install compliant version, if available, or do not use.
Call Classification Report and 02/29/00 (page -16): In some cases, the Call Classification report does not accept the report date of 02/29/00.	Use alternative action provided.
Console Messages with IBM 3270 Synchronous Host Feature (page -17): If you have the IBM 3270 Synchronous host feature installed, some console messages might display the year in three digits on or after 1/1/2000.	Be aware of situation.
Changing the System Date to the 31st (page -17): When you set your system date ahead to do year 2000 testing, the sysadm utility will not support setting the date to the 31st of a month if the current date displayed through this utility is the last day of a month with less than 31 days.	Fixed in V7.0 RFU+A (QPPCN 1101). Alternative action also provided.
Changing the System Date and Daylight Saving Time (page -18): When you change the system date to a date from a different time mode (daylight saving time versus standard time), the system time is off by an hour or more upon rebooting.	Fixed in V7.0 RFU+A (QPPCN 1101).

Continued on next page

Table 3. Summary of Areas Requiring Additional Consideration — *Continued*

Area	Status/Action
Specifying Multiple Dates as Holiday (page -18): Script Builder mistakenly accepts two-digit years for holiday settings when the date entered is not the first entry.	Fixed in V7.0 RFU+A (QPPCN 1101). Can prevent by always using 4-digit years.
lp Print Command Header (page -19):The header page produced by the lp print command displays 21st century years as 1*xx*.	Fixed in V7.0 RFU+A (QPPCN 1101).
Formats for Speaking Dates (page -19): For U.S. English Enhanced Basic Speech and U.S. English Text to Speech (TTS), some formats were awkward for speaking dates after 2000.	Fixed in V7.0 RFU+A (QPPCN 1101).
Alternative Methods for Database Records with Time Fields (Appendix A, "For Advanced Users"): If a CONVERSANT database record contains a time field and was created before the year 2000, the CONVERSANT application will not be able to query a record using the time field as the search criteria, or modify or delete a record in the table containing the time field.	Fixed in INTUITY ORACLE 7 Integration Package — Patch 1 (QPPCN 1167B).

Determining If the Updates Are Installed

CONVERSANT Version 7.0 RFU+A

Many of the areas in this section are fixed by remote-field update CONVERSANT Version 7.0 RFU+A, delivered in QPPCN 1101 (mailed to all V7.0 customers in September and October 1999). To determine if your system has the V7.0 RFU+A update installed, complete these steps:

1. Log in as **root**

2. At the UnixWare prompt, enter **pkginfo V70rfu+a**
   If the update is installed, the system displays a list of the packages contained in the V7 RFU+A set. If the update is not installed, the system displays the following message: `UX:pkginfo: ERROR: information for "V70rfu+a" was not found`

INTUITY ORACLE 7 Integration Package, Patch 1

The problem involving database records and time fields was fixed in INTUITY ORACLE 7 Integration Package — Patch 1, QPPCN 1167B. This patch was mailed with QPPCN 1101 to all V7.0 customers in September and October 1999. To determine if your system has this update installed, complete these steps:

1. Log in as **root**

2. At the UnixWare prompt, enter **pkginfo ora7I+p1**
   If the update is installed, the system displays the package name. If the update is not installed, the system displays the following message:
   ```
   UX:pkginfo: ERROR: information for "ora7I+p1" was not
   found
   ```

Areas to Consider

The following sections provided more detailed information on the areas described in Table 3 on page -12. In many cases, alternative or preventative actions are provided.

Time Zone Differences on 12/31/1999 and 01/01/2000

Status: Be aware of situation; no alternative or preventative actions.

Be aware that some of your applications could be affected because of different time zones. During either the last hours of December 31, 1999, or the beginning hours of January 1, 2000, the following two areas could yield inaccuracies if an application is using two-digit years:

— Applications inserting a two-digit year into a Script Builder database table

— Applications accepting a two-digit year in a Script Builder Host date field (the Y format for the year field) from an IBM host

➡ **NOTE:**
Using four-digit years will prevent these errors from occurring.

In both types of applications, the CONVERSANT system converts the two-digit year to a four-digit year by adding the current century, either "19" or "20", to the front of the two-digit value. The CONVERSANT system uses Greenwich Mean Time (GMT) to determine the current century. Inaccuracies can occur because of the time difference between midnight GMT and midnight for the time zones for your applications.

At 12:00 a.m. (midnight) on 1/1/2000 in the GMT zone, the CONVERSANT system will begin to insert the century digits of "20" to all two-digit years, regardless of the time zones in which your applications are running.

For example, if the application is in Tokyo, Japan, it will be 9:00 a.m. on 1/1/2000 when it is 12:00 a.m. (midnight) GMT. Therefore, during the first nine hours of 1/1/2000 in Tokyo, you could have applications that will still be assuming century digits of "19" when the current century for that location has already changed to 2000. Conversely, if the application is in Denver, North America, 12:00 a.m. (midnight) for that system will occur seven hours after it is midnight GMT. Therefore, during the last seven hours of 12/31/1999 in Denver, you could have applications that will be assuming century digits of "20" while the current year for that location is still 1999.

Table 4 shows the relation of GMT to some sample time zones and the hours that are vulnerable for this kind of inaccuracy on 12/31/1999 and 1/1/2000. Note that the times given in the table do not reflect daylight savings time.

Table 4.   Time Zones

Hourly Difference from GMT	Cities	Time When It Is 12:00 am GMT	Window for Error
-8 (Pacific)	Seattle Los Angeles San Diego	4:00 pm on 12/31/99	Last 8 hours of 12/31/99: 4:00 pm to 12:00 am 1/1/2000
-7 (Mountain)	Salt Lake City Denver Phoenix	5:00 pm on 12/31/99	Last 7 hours of 12/31/99: 5:00 pm to 12:00 am 1/1/2000
-6 (Central)	Chicago St. Louis New Orleans	6:00 pm on 12/31/99	Last 6 hours of 12/31/99: 6:00 pm to 12:00 am 1/1/2000
-5 (Eastern)	New York City Washington DC Orlando	7:00 pm on 12/31/99	Last 5 hours of 12/31/99: 7:00 pm to 12:00 am 1/1/2000
-3	Brasilia Buenos Aires	9:00 pm on 12/31/99	Last 3 hours of 12/31/99: 9:00 pm to 12:00 am 1/1/2000
0 GMT	**Greenwich London**	**12:00 am** (midnight 12/31/1999)	**None**
+1	Berlin Paris	1:00 am on 1/1/2000	First 1 hour of 1/1/2000: 12:00 am to 1:00 am

Continued on next page

Table 4. Time Zones — *Continued*

Hourly Difference from GMT	Cities	Time When It Is 12:00 am GMT	Window for Error
+5.30	Bombay New Delhi	5:30 am on 1/1/2000	First 5 1/2 hours of 1/1/2000: 12:00 am to 5:30 am
+9	Tokyo Osaka	9:00 am on 1/1/2000	First 9 hours of 1/1/2000: 12:00 am to 9:00 am
+10	Melbourne Sydney	10:00 am on 1/1/2000	First 10 hours of 1/1/2000: 12:00 am to 10:00 am

Datakit and uucico Command

Status: Use preventative action provided below.

Customers who have a Datakit connection to the INTUITY CONVERSANT system (mostly AT&T or internal Lucent Technologies customers), use a package called *Commkit Host Interface to AT&T Data Switch Package.* This package overwrites some UnixWare files on the system, such as uucico and uucp, with versions that have been altered to work with Datakit. The INTUITY CONVERSANT System V7.0 contains the standard UnixWare version of these files, which have been made year 2000 compliant. Because the V7.0 files do not contain the Datakit alterations, your system cannot work with Datakit. If the customer loads the V7.0 onto a system with the Commkit package, failures will occur when a user attempts to use the uucico command across the Datakit network.

Preventative Action: Contact the Commkit vendor and find out if they have a version that is year 2000 compliant. If one is available, reinstall it after you have installed INTUITY CONVERSANT System V7.0. If there is not a version that is year 2000 compliant, you will have to choose between Datakit access and year 2000 compliance for the uucico command.

Call Classification Report and 02/29/00

Status: Use alternative action provided below.

When accessed through the cvis_menu, the Call Classification report does not accept the report date of 02/29/00. (For more information on the Call Classification report, see *INTUITY CONVERSANT System Version 7.0 Administration*, 585-313-501.)

Alternative Action: Invoke the Call Classification report from the UnixWare command prompt. Sample commands are provided below. Keep in mind that call classification data is available only after the data has been summarized. The

day's data is summarized through a cron job just after midnight of that day. For example, data for 2/29/00 becomes available after approximately 12:20 AM on 3/1/00.

Table 5.   Sample UnixWare Commands for Call Classification Report

Sample Command	Result
/vs/bin/ccarpt 02/29/00	Displays call classification information for the outgoing calls attempted by your CONVERSANT system on 2/29/00.
/vis/bin/ccarpt 02/01/00 02/29/00	Displays call classification information for the outgoing calls attempted by your CONVERSANT system from 2/1/00 through 2/29/00.

Console Messages with IBM 3270 Synchronous Host Feature

<u>Status</u>: Be aware of situation; no alternative or preventative actions.

If the IBM 3270 synchronous host feature is installed, the console might occasionally display messages on or after January 1, 2000, that present the year in three digits. In such instances, 100 represents year 2000, 101 represents year 2001, and so forth. For example, January 1, 2000, at 7:59 AM might be displayed as "07:59:14 01/01/**100**".

Changing the System Date to the 31st

<u>Status</u>: Fixed in remote-field update CONVERSANT Version 7.0 RFU+A (QPPCN 1101). Alternative action also provided below.

If you test your applications for year 2000 issues, you will set your system date ahead in order to test. The datetime option of the sysadm utility functions correctly except in the following unique case: when the current date displayed through the sysadm utility is the last day of the month, and that last day is the 28th, 29th, or 30th of the month (in other words, it is the last day of a month with less than 31 days). In this case, you cannot set the date to the 31st of a month with 31 days. For example, if the current date is November 30, 1998 (November has only 30 days), you cannot set the date to December 31, 1999.

Alternative Action: As long as the current date is not the last day of a month with less than 31 days, you do not need to use an alternative action. However, if the current date meets the criteria shown above and you want to change the date to the 31st, use this procedure:

1. Change the date to a day other than the last day of the month (such as the first day of the next month).

2. Save the screen.

3. Change the date to the 31st of the desired month and year. Use the guidelines given in "Testing Guidelines" in Appendix A, "For Advanced Users".

Changing the System Date and Daylight Saving Time

Status: Fixed in remote-field update CONVERSANT Version 7.0 RFU+A (QPPCN 1101).

When testing your CONVERSANT system for year 2000 compliancy, you will be setting the system date to a different date. If you change the system date to a date in a different time mode, daylight saving time versus standard time, the system time will not reflect the different time mode and can be off by an hour or more. For example, if you are in a time zone that is currently observing daylight saving time (April to October), and you change the system date to a date in standard time (November to March), the hour difference is not taken into account when you reboot. The system time will be off by an hour.

For guidelines to use when changing the system date ahead, see "Testing Guidelines" in Appendix A, "For Advanced Users".

Specifying Multiple Dates as Holidays

Status: Fixed in remote-field update CONVERSANT Version 7.0 RFU+A (QPPCN 1101). Preventative action also provided below.

When you are using Script Builder to specify a date to be handled as a holiday, the system requires you to enter a four-digit year for the first holiday date that you specify. However, if you save that holiday setting and then specify one or more additional dates as holidays, the system will accept some two-digit years if you enter one by mistake. In such circumstances, the system will accept any two-digit year that does not start with a zero. Even though the system allows you to enter two-digit years in such cases, those dates will not receive holiday handling.

Preventive Action: Make sure that you enter four-digit years for all dates that you specify as holidays.

lp Print Command Header

Status: Fixed in remote-field update CONVERSANT Version 7.0 RFU+A (QPPCN 1101).

The header page produced by the lp print command displays 21st-century years as *1xx*. For example, the year 2000 is printed as *100*, 2014 is printed as *114*, and so forth.

Formats for Speaking Dates

Status: Fixed in remote-field update CONVERSANT Version 7.0 RFU+A (QPPCN 1101).

Fixed in remote-field update CONVERSANT Version 7.0 RFU+A. For U.S. English Enhanced Basic Speech and U.S. English Text to Speech (TTS), some formats were awkward for speaking dates after the year 2000. Table 6 describes how dates are spoken after 2000 after you have loaded V7.0 RFU+A.

> **NOTE:**
> A format ending in "Y" indicates a two-digit year, and a format ending in "YY" indicates a four-digit year.
>
> U.S. English Enhanced Basic speech formats begin with "D", and U.S. English TTS formats begin with "A".

Table 6. Formats for Speaking Dates

Date Formats	Years	Spoken formats	Examples
2-digit formats:	2000	zero-zero	"zero-zero"
DMDY, DMSPDY, ADMDY, or ADMSPDY	2001 – 2009	zero-*<year>*	"zero-five" for 2005 (Previously "oh-*<year>*" for US English Enhanced Basic Speech)
	> 2009	*<year>*	"ten" for 2010

Continued on next page

Table 6. Formats for Speaking Dates — *Continued*

Date Formats	Years	Spoken formats	Examples
4-digit formats:	2000	Two thousand	"two thousand"
			(Previously "twenty zero-zero" for ADMDYY format)
DMDYY, DMSPDYY, ADMDYY, or ADMSPDYY	2001 – 2009	Two thousand *‹year›*	"two-thousand-five" for 2005
			(Previously "twenty-oh-‹*year*› for US English Enhanced Basic Speech and ""twenty-zero‹*year*›" for US English TTS)
	> 2009	Twenty-‹*year*›	"twenty-ten" for 2010

For Advanced Users

A

Overview

This appendix contains the following information designed to help advanced users:

- Guidelines for testing your applications — General guidelines for testing for year 2000, should you choose to test your own applications. Note that Lucent Technologies *strongly recommends* that you contract with a software provider to test your applications.

- Alternative methods for database records with time fields — Descriptions of the problem involving the time fields in database records, the update that fixes it, and alternative methods to work around it.

Guidelines for Testing Your Applications

You are responsible for ensuring that your INTUITY CONVERSANTV 7.0 custom applications can continue to operate through the year 2000. To perform this testing, Lucent Technologies *strongly recommends* that you work with a software provider. If you choose to do this work yourself, we offer these general guidelines for testing for year 2000.

Before You Begin

Before you start to test your applications, review the following list and perform any necessary procedures. Proper preparation is crucial for successful testing.

■ Check with your application developer or ISV (independent software vendor) to see if your CONVERSANT system uses the TCP/IP time server (**/usr/sbin/in.timed**) to synchronize the CONVERSANT system date and time with that of another system. Because this service continuously resets the CONVERSANT date and time to that of the other system, you must either disable the service or ensure that the other system is set to the same testing date. The CONVERSANT system does not automatically use the TCP/IP time server, but your application developer or ISV might have invoked this utility through an entry in a UnixWare directory such as **/etc/inittab** or **/etc/rc2.d**.

■ Do all year 2000 testing on a machine that does not take live call traffic at any time, either during or after your testing.

■ Perform a complete backup (mkimage) of the system. This step is critical because you will need to restore your system from this backup after you are done testing. Some features, such as reports or error logging, might not operate correctly after you have set the system date ahead to 2000 and then back to the current year. For instructions on backing up your system, see the section on common system procedures in *INTUITY CONVERSANT System Version 7.0 System Reference*, 585-313-205.

■ Have a written test plan ready.

Testing Guidelines

Use the following steps as a guide in testing applications for year 2000:

⇒ **NOTE:**
All year 2000 testing should be done on a machine that does not take live call traffic at any time, either during or after your testing.

1. With the system set at the current date:

   a. Test all applications, custom reports, custom menus, and so on. Ensure that all applications are working.

   b. Record your results on the test plan.

2. Set the system date to December 31, 1999, at 11:00 p.m. Note that we recommend setting the time to 11:00 p.m. If you set the system time too close to midnight, some UnixWare processes might fail. By setting the time to 11:00 p.m., the system will advance normally to midnight without these failures.

If you have not installed V7.0 RFU+A, be sure and read "Changing the System Date to the 31st" on page -17. If the current date is the last day of a month that has less than 31 days, you must first set the date to a different date before setting it to December 31.

To set the date and time ahead, do the following:

   a. Log in as **root**

   b. At the UnixWare prompt, enter **init 1** so that you are in single-user mode.

   c. Log in again as **root**

   d. At the UnixWare prompt, enter **su - sysadm**

      Your user ID is changed to sysadm, and the sysadm screens are displayed.

   e. Select `system_setup` and press ⎡ENTER⎤.

   f. Select `datetime` and press ⎡ENTER⎤.

   g. Select `set` and press ⎡ENTER⎤.

      The Set System Date and Time Information screen is displayed.

   h. Change the date and time.

   i. Press ⎡F3⎤ (Save) to save your changes.

      The system displays a message confirming the new date and time.

   j. Press ⎡F7⎤ (Cmd-Menu).

      The Command Menu is displayed.

   k. Select `exit` and press ⎡ENTER⎤

      You are returned to the UnixWare prompt.

3. Shut down and restart the system. This step ensures that all system processes are updated with the new date and time of the system.

⚠ **CAUTION:**

   If you do not shut down and restart the system after you have set the date ahead, some UnixWare processes could fail and compromise your test efforts.

To shut down and restart the system, follow these steps:

   a. At the UnixWare prompt, enter **cd /**

   b. At the next UnixWare prompt, enter **/etc/shutdown –g0 –y**

      After a few moments, the system displays the following message:

      `Press any key to reboot.`

   c. Press any key to reboot.

4. After the system has restarted, begin testing custom applications and all other components that you tested in Step 1. Be sure to do the following:

   - Record your results on your written test plan.

   - Start your testing at a time before your system time reaches midnight, and continue to test through the rollover to 2000.

   - Ensure that some test calls begin in year 1999 and end in 2000.

   - Continue to run calls through the system for some time after the system date reaches 2000.

5. Review the results of the testing in Step 4 with that done in Step 1. You should expect that your custom applications, reports, and so forth all work the same before and after 2000. All custom menus or commands that accept years should allow data to be entered as "2000" or "00", whichever is appropriate.

6. When you are satisfied that your custom applications work beyond 2000, set the system back to the current date and time using the **sysadm** command:

   a. Log in as **root**

   b. At the UnixWare prompt, enter **init 1** so that you are in single-user mode.

   c. Log in again as **root**

   d. At the UnixWare prompt, enter **su - sysadm**

      Your user ID is changed to sysadm, and the sysadm screens are displayed.

   e. Select `system_setup` and press ⌷ENTER⌷.

   f. Select `datetime` and press ⌷ENTER⌷.

   g. Select `set` and press ⌷ENTER⌷.

      The Set System Date and Time Information screen is displayed.

   h. Change the date and time.

   i. Press ⌷F3⌷ (Save) to save your changes.

      The system displays a message confirming the new date and time.

   j. Press ⌷F7⌷ (Cmd-Menu).

      The Command Menu is displayed.

   k. Select `exit` and press ⌷ENTER⌷

      You are returned to the UnixWare prompt.

7. Restart the system:

   a. At the UnixWare prompt, enter **cd /**

   b. At the next UnixWare prompt, enter **/etc/shutdown –g0 –y**

After a few moments, the system displays the following message:

```
Press any key to reboot.
```

c. Press any key to reboot.

8. Restore the system from the mkimage tape. For instructions on restoring your system, see the section on common system procedures in *INTUITY CONVERSANT System Version 7.0 System Reference*, 585-313-205. If you do not restore your system from the mkimage tape, the system may not operate correctly, as some files on the system now have timestamps in the future.

Alternative Methods for Database Records with Time Fields

If a CONVERSANT database record contains a time field and was created *before* the year 2000, the CONVERSANT application will not be able to perform the following actions if the record is then accessed *after* the year 2000:

■ Query a record using the time field as the search criteria

■ Modify a record in the table containing the time field

■ Delete a record in the table containing the time field

For example, this problem might occur in a CONVERSANT application that accepts calls from people requesting a catalog (a "form-filler" kind of application). The application records the caller's voice input, such as name and address, and stores the voice-phrase tags in a local database table. It also stores the date and time of the call using a time field. Later, an agent calls into the CONVERSANT system to transcribe the caller's information so the catalog can be sent. Typically, the agent listens to the record and then deletes it once the mailing has been invoked. If the caller calls in before year 2000, and the agent tries to transcribe on or after 1/1/2000, the agent can listen and transcribe the caller's responses but cannot delete those records in the database.

This problem does not occur if the record with a time field is created and accessed within the same century. Also, applications that represent time with the $UNIX_TIME timestamp or a character field are not affected.

About the Update Patch

This problem is fixed in INTUITY ORACLE 7 Integration Package — Patch 1, QPPCN 1167, which is being sent to all CONVERSANT V7.0 customers. It is recommended that customers install the update patch. However, this section gives procedures you can use if you need a method to work around the problem without using the update patch. Note that the update patch can be installed at any time, but the alternative methods must be performed at the end of 1999, after the last call of 1999 and before the first call of year 2000.

Before the update is installed, the CONVERSANT database table time fields are stored in an ORACLE database date field, which contains both a date and time. If values are assigned to a CONVERSANT database table time field (through manual editing or by a CONVERSANT application), the CONVERSANT ORACLE database interface process (DIP), **/vs/bin/vrs/oraldb**, stores a dummy value in the date portion of the ORACLE date field. Then, when accessing the CONVERSANT database time fields, the **oraldb** DIP file queries the record using both the time and dummy date.

After you install Intuity ORACLE 7 Integration Package — Patch 1, ORACLE supplies a default value for the date when storing a CONVERSANT database time field. When inserting a value into a CONVERSANT database time field, the **oraldb** file provides only the time portion and lets ORACLE insert the first day of the month as the standard value for the date portion. Also, the **oraldb** file now does not query or access a record using the date portion of the field; it only uses the time portion of the field to query or access a record.

Alternative Methods

The following methods are available if you need to work around the problem without using the update patch. Both methods must be performed at the end of 1999, after the last call that could insert records in the 20th century and before the first call that could access or insert records in the 21st century. Each is described in more detail below.

- Transcribe before 2000

- Adjust the date using SQL commands (for qualified application developers only)

> **NOTE:**
> Even if you use this alternative method, Lucent Technologies recommends you install the update patch at the next convenient time. The changes you make using this method can be lost, for example, if a previous backup is loaded in error.

Transcribing

For some types of applications, such as the form-filler example previously described, problems with the database time field can be avoided by transcribing all existing caller records in the database before the first call is taken in year 2000.

Using SQL Commands to Adjust the Date

Transcribing is not an appropriate solution for some types of applications. In such cases, you can adjust the date portion of the database time fields using SQL commands. The date portion is changed from Jan 01, 1901, to Jan 01, 2001. Note that this method should be performed only by qualified application developers.

NOTE:
Using this method does not affect any future installation of Intuity ORACLE 7 Integration Package — Patch 1.

Procedure

Use the following basic procedure to adjust the date. Immediately following this section is an expanded example of this procedure performed on a database table named *orders*.

1. Confirm that your application uses a database time field.

2. Determine the name of both the database table (*dbtablename*) and the time field within the table (*timefield*).

3. Log in to the CONVERSANT system as **root**

4. Back up the database table using the Script Builder application Backup option for Database tables. (From the cvis_menu, select Script Builder Applications, select the application name, select Backup, select Database).

   Repeat this step for all database tables that are affected by the problem. Label the backups to indicate they were made prior to this procedure.

5. At the UnixWare prompt, enter **sqlplus sti/sti**

   The system displays the SQL> prompt.

6. Start a spool file to record the session. At the SQL> prompt, enter:

   spool *filename*

   For *filename*, type the name you want to give the file. To view the results in this file, after you have completed the procedure, enter **pg *filename*** at the UnixWare prompt.

7. At the SQL prompt, enter:

   update "*dbtablename***" set "***timefield***" = "***timefield***" + 36525;**

   For *dbtablename*, type the name of the database table (such as "orders"), and for *timefield*, type the name of the time field in the database (such as "order_time"). Use quotes if you enter the variables in lower-case letters, but do not use quotes if you use upper-case letters. Valid examples are **update "orders"** or **update ORDERS**

This command updates the time fields in the database table from Jan 01, 1901, to Jan 01, 2001, by adding to the field the number of days between these dates. (There are 36,525 days between 1/1/1901 and 1/1/2001.)

8. Repeat step 7 for all database tables affected by this problem. Make sure this procedure if performed after the last call that could insert records in the 20th century and before the first call that could access or insert records in the 21st century.

9. Perform a second Script Builder backup of all database tables altered by this procedure. Indicate on the backup that it was done *after* performing this procedure.

10. Also perform a backup using the mkimage command to ensure the current copy of the tables are saved. For details on the mkimage command, see *INTUITY CONVERSANT Version 7.0 Administration,* 585-313-501.

Example

The following example applies the basic procedure to a database table named *orders*. This example includes extra steps to display and verify your changes and assumes you already have performed steps 1 through 4 of the basic procedure.

1. At the UnixWare prompt, enter **sqlplus sti/sti**

   The system responds with:

   ```
   SQL*Plus: Release 3.3.3.0.0 – Production on Wed Aug 18
   15:42:28 1999
   Copyright (c) Oracle Corporation 1979, 1996. All rights
   reserved.
   Connected to:
   Oracle7 Server Release 7.3.2.3.0 – Production Release
   PL/SQL Release 2.3.2.3.0 – Production
   ```

2. At the SQL> prompt, enter **spool oracle.out** to start the spool file.

3. Display the number of rows in the table so you are aware of the number of rows that will be updated. Enter **select count(*) from "orders";**

   The system displays the count of rows. The orders table in this example has 5 rows; your table will likely have many more rows.

   ```
     COUNT(*)
   ----------
        5
   ```

4. To view the date and time portion of the field *order_time* in the table *orders,* enter:

   select to_char("order_time", 'MON-DD-YYYY HH24MISS') order_time from "orders";

The system displays for each row the date and times stored in the order_
time field. (The number of rows displayed should equal the number of
rows in the table, as shown in step 3.) Note that the date is always
JAN-01-1901.

```
ORDER_TIME
------------------------------------------------
JAN-01-1901 030000
JAN-01-1901 031200
JAN-01-1901 161000
JAN-01-1901 221200
JAN-01-1901 121400
```

5. Update the date portion of the field to Jan 01, 2001. Enter:

   update "orders" set "order_time" = "order_time" + 36525;

   The system displays the number of rows that were updated. (This should
   equal the number of rows in the table, as shown in step 3.)

   ```
   5 rows updated.
   ```

6. To confirm that the date portion has been updated to Jan-01-2000, enter:

   **select to_char("order_time", 'MON-DD-YYYY HH24MISS') order_time
   from "orders";**

   The system displays the contents of the date and time portion of the
   order_time field. The dates should all say JAN-01-2001 and the times
   should not be changed from the display in step 4.

   ```
   ORDER_TIME
   ----------------------------------------------
   JAN-01-2001 030000
   JAN-01-2001 031200
   JAN-01-2001 161000
   JAN-01-2001 221200
   JAN-01-2001 121400
   ```

7. To save the changes, enter **commit;**

   The system displays the following message: Commit complete.

8. To quit the system, enter **quit:**

   The system displays the following message:

   ```
   Disconnected from Oracle7 Server Release 7.3.2.3.0 -
   Production Release
   ```

   ```
   PL/SQL Release 2.3.2.3.0 - Production
   ```

9. To view the spool file, enter **pg oracle.out**

We'd like your opinion.

Lucent welcomes your feedback on this document. Your comments can be of great value in helping us improve our documentation.

INTUITY™ CONVERSANT® System Version 7.0 Year 2000 Compliance
Document Number 585-313-505, Issue 2, August 1999, Comcode 108586868

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