Y2K Compliance Report

IPAM 6.0

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Y2K Compliance Statement

The IPAM 6.0 product is Y2K compliant.

By *IPAM 6.0* we mean the behavior of IPAM 6.0 software, including all embedded third-party components, operating on the hardware platform we recommend.

Although the manufacturers of some of our embedded third-party components do not claim that those components are fully Y2K compliant, we have researched their compliance status and tested them inasmuch as they interact with IPAM 6.0. We have determined that whatever problems these components might have, they are fully Y2K compliant with respect to the specific functions and services that IPAM 6.0 uses.

By *Y2K compliant*, we mean:

1) All operations give consistent results whether dates in the data, or the current system date, are before or on, or after January 1, 2000.

2) All leap year calculations are correct (February 29, 2000 is a leap day).

3) All dates are properly and unambiguously recognized and presented on input and output interfaces (screens, reports, files, etc.).

Y2K Compliance Validation Strategy

We validated Y2K compliance through a combination of architectural review, supplier research, and testing.

Architectural Review

Each developer on the IPAM team reviewed his section of the product and reported that he was aware of no use or occurrence of dates or date functions that would cause IPAM 6.0 not to comply with our Y2K standard.

Two issues were identified that we will continue to monitor, however:

1) EPO data formats are date-sensitive, so our data production tools will have to be updated when the EPO upgrades those formats. The EPO has announced upgrade plans, and we foresee no difficulties here.

2) Over the course of 1999 we will probably upgrade some of our third-party components, such as SQL Server, and we may have to repeat our compliance review at that time to assure that no regression has occurred.

Supplier Research

We inventoried each of the components that are embedded in IPAM, or upon which it depends, that are developed by other companies. We contacted each of those companies to get their statement of Y2K compliance.

Although some of these components are reportedly not fully compliant, our research and testing indicates that whatever non-compliances exist do not affect the compliance of the overall IPAM system, since IPAM does not rely on the particular non-compliant portions of those components.

Component	Status	Source
Adobe Acrobat 3.0	Compliant	http://www.adobe.com/newsfeatures/year2000/prodsupport.html http://www.adobe.com/newsfeatures/year2000/prodlist.html
Dell Power Edge 6100	Compliant	http://www.dell.com/year2000/faq/faq.htm http://www.dell.com/year2000/products/servers/servers.htm
ERLI Lexiquest	Compliant	Written statement from ERLI
Fulcrum	Compliant	http://www.fulcrum.com/english/headlines/Year2000.htm
InstallShield 5.1	Compliant	http://www.installshield.com/products/year000.asp
Microsoft IE 4.0 / Wininet.dll	Compliant /w SP1 Patch	http://www.microsoft.com/ithome/topics/year2k/product/IE4-32bit.htm
Microsoft NT 4.0	Compliant w/ Patch > SP3	http://www.microsoft.com/ithome/topics/year2k/product/WinNt40wks.htm
Microsoft SQL Server 6.5	Compliant w/ SP5 Patch	http://www.microsoft.com/ithome/topics/year2k/product/SQL65.htm
Microsoft Visual C++ 5.0	Compliant w/ Minor issues	http://www.microsoft.com/ithome/topics/year2k/product/VisualCC5.htm
Object Space 2.0.1	Compliant	http://www.objectspace.com/toolkits/whats%5Fnew.html
Seagate Crystal Reports 6.0	Compliant w/ Patch	http://www.seagatesoftware.com/products/bi/library/whitepapers/content.asp
Windows95/98	Compliant	http://www.microsoft.com/ithome/topics/year2k

Testing

Y2K compliance can be difficult to validate, so in addition to architectural review and supplier research, we also designed and executed a Y2K compliance test process. Areas of IPAM functionality which involve dates were exercised in various ways using critical date values for both data and the system clock. Areas of IPAM functionality which do not involve dates were sanity checked (about 8 total hours of functional testing) in case there was some hidden date dependency.

The remainder of this report documents the specific test strategy and results.

Test Approach

Our test approach is risk-based. That means we first imagine the kinds of important problems that could occur in our system, then we focus our testing effort on revealing those problems.

Risk Analysis Process

Our architectural review and supplier research gave us our first inkling of where problem

areas might be. We also used the problem catalog in an article by James Bach and Mike Powers, *Testing in a Year 2000 Project*, (www.year2000.com) as a source of ideas for potential problems.

Basically, we looked for any features in our product that stored or manipulated dates, and focused our efforts there.

Potential Risks

Our analysis gave use no specific reason to believe that there would be any Y2K compliance problems. However, if there were indeed such problems, they would most likely fall into one of these categories:

1**) Incorrect search results for date-related searches.**

2) Incorrect display of dates in IPAM Workbench window or Abstract window.

3) Incorrect handling and display of dates in the Patent Aging Report.

4) Incorrect handling and storage of dates in Corporate Document Metadata.

5) Failures related to the date of server system clock. These failures include "rollover" problems, whereby the *transition* across a critical date triggers a failure, as well as other failures caused by the clock being set on or after a critical date.

6) Failures related to the date of client system clock. (see note, above)

7) Failures related to dates in data. These failures include manipulation of dates before and after critical dates.

8) Failures related to critical dates. Y2K compliance failures are likely to be correlated with the following dates within test data:

- September 9, 1999
- December 31, 1999
- January 1, 2000
- January 3, 2000
- February 28, 2000
- February 29, 2000
- March 1, 2000
- March 31, 2000
- December 31, 2000
- February 28, 2001
- February 29, 2004

Note: For the system clock, we believe there is only one critical date: January 1, 2000.

9) Failures related to non-compliant platform components. It's possible that a particular computer, network card, or other component could influence the operation of IPAM 6.0 if it is not itself Y2K compliant.

10) Database corruption. It's possible that Y2K non-compliance in IPAM 6.0 or SQL Server could corrupt the patent database.

11) Failures related to specific *combinations* of any of the factors, above.

Unknown Risks

A generic risk with risk-based testing is that we may overlook some important problem area. Thus, we will also do some testing for failures that may occur in functionality that has nothing to do with dates due to some hidden dependency on a component that *is* sensitive to dates.

Problem Detection

During the course of testing, we detected errors in the following ways:

- Any test result containing a date with a year prior to 1972 would be suspect, as test data contained patents only after 1971.
- Testers were alert to any instances of two-digit date display that might indicate underlying date ambiguity.
- For most search tests, testers predicted the correct number of search hits and compared those to test results. For some searches, the returned patent numbers were verified.
- Due to the nature of IPAM, most data corruption is readily detectable through the normal course of group management and search testing. However, it is still possible that the database could be corrupted in a way that we could not detect.
- Each tester is familiar with the way the product should work and was alert to any obvious problems or inconsistencies in product functionality, including crashes, hangs, or anything that didn't meet expectation.

Test Plan

Level of Effort

Two testers spent about 3 work days, each, performing this process. Three other testers also assisted for one day during phase 2 testing, detailed below. Date engineering required an additional 2 days to create dummy test data.

Tools

The search tests were automated using Perl and are repeatable on demand. All other tests were completed manually with human verification.

Platforms

The server hardware platform was the Dell Power Edge 6100, with a clean version of the IPAM 6.0 server installed. No extraneous applications were running run during the Year 2000 Compliance test process.

The client test platforms were 4 machines running Windows 95 or NT and the IPAM 6.0 client.

Process

Phase 1

Rolled the system clocks forward to 1/1/2000 and executed a sanity check on the test platforms without running IPAM 6.0 at all. (1 hour).

Phase 2

Executed a general functionality test on all major areas of IPAM 6.0 with the system clock at 1/1/2006, but without any aged data.

Phase 3

Executed automated and manual tests on designated risky functional areas (risks 1 through 4, above) using an aged data set containing 252 various patents and 10 documents with a mixture of 20th and 21st century dates. Every date in the data set was increased by twenty years to ensure that dates in the set data occurred before, during, and after January 1, 2000. Also, some of the dates in the dummy data were set to a random selection of critical dates.

Phase 4

Set the server and client clocks to 11:55 pm on December 31, 1999, and allowed rollover to January 1, 2000, then executed the automated search tests and a few other ad hoc tests. We then rebooted the server and client machines and repeated that process.

Test Results

We found no Y2K compliance problems at all, in the behavior of IPAM 6.0, during the course of our tests. This is consistent with our architectural review and the specific issues uncovered by our supplier research.

Although no testing process can prove the absence of bugs, our testing gives us reasonable confidence that there are no important (meaning high probability and/or high impact) Y2K compliance problems in IPAM 6.0.

Appendix: Test Cases

This table summarizes which test sets were conducted with what kind of aged data.

	Pre-2000	Post-2000	Span 2000	Leap Year
Aging Report	✓	✓	✓	✓
Search	✓	✓	✓	✓
Corporate	✓	✓		✓
Non-search	✓	✓		✓

Each table, below is a list of specific, planned test cases conducted in each functional area called out in our risk analysis. In addition to these, numerous ad hoc tests were also performed.

Patent Aging Report Test Cases (phase 2 and 3)

Patents	Report Type	Expiration Date	Groups to Include
All	Text	Before	No Subgroups
All	Text	Between 1999-2000	Some Subgroups
All	Text	Between 2000-2000	All Subgroups
All	Excel	Before	Some Subgroups
All	Excel	Between 1999-2000	All Subgroups
All	Excel	Between 2000-2000	No Subgroups
All	Graph	Before	All Subgroups
All	Graph	Between 1999-2000	No Subgroups
All	Graph	Between 2000-2000	Some Subgroups
EPO	Text	Before	Some Subgroups
EPO	Text	Between 1999-2000	All Subgroups
EPO	Text	Between 2000-2000	Some Subgroups
EPO	Excel	Before	All Subgroups
EPO	Excel	Between 1999-2000	No Subgroups
EPO	Excel	Between 2000-2000	All Subgroups
EPO	Graph	Before	No Subgroups
EPO	Graph	Between 1999-2000	Some Subgroups
EPO	Graph	Between 2000-2000	No Subgroups
US	Text	Before	All Subgroups
US	Text	Between 1999-2000	Some Subgroups
US	Text	Between 2000-2000	All Subgroups
US	Excel	Before	No Subgroups
US	Excel	Between 1999-2000	All Subgroups
US	Excel	Between 2000-2000	No Subgroups
US	Graph	Before	Some Subgroups
US	Graph	Between 1999-2000	No Subgroups
US	Graph	Between 2000-2000	Some Subgroups

Search Test Cases (3 and 4)

Patent Type	Issue Date	Filing Date
All	After	Between 1999-2000
All	After	N/A
All	Before	After
All	Before	N/A
All	Between 1999-2000	Between 2000-2000
All	Between 1999-2000	N/A
All	Between 2000-2000	N/A
All	Between 2000-2000	On
All	N/A	After
All	N/A	Before
All	N/A	Between 1999-2000
All	N/A	Between 2000-2000
All	N/A	On
All	On	Before
All	On	N/A
EP-A	After	Between 1999-2000
EP-A	After	N/A
EP-A	Before	After
EP-A	Before	N/A
EP-A	Between 1999-2000	Between 2000-2000
EP-A	Between 1999-2000	N/A
EP-A	Between 2000-2000	N/A
EP-A	Between 2000-2000	On
EP-A	N/A	After
EP-A	N/A	Before
EP-A	N/A	Between 1999-2000
EP-A	N/A	Between 2000-2000
EP-A	N/A	On
EP-A	On	Before
EP-A	On	N/A
EP-B	After	Between 1999-2000
EP-B	After	N/A
EP-B	Before	After
EP-B	Before	N/A
EP-B	Between 1999-2000	Between 2000-2000
EP-B	Between 1999-2000	N/A
EP-B	Between 2000-2000	N/A
EP-B	Between 2000-2000	On
EP-B	N/A	After
EP-B	N/A	Before
EP-B	N/A	Between 1999-2000
EP-B	N/A	Between 2000-2000
EP-B	N/A	On
EP-B	On	Before
EP-B	On	N/A
PCT	After	Between 1999-2000
PCT	After	N/A
PCT	Before	After
PCT	Before	N/A
PCT	Between 1999-2000	Between 2000-2000
PCT	Between 1999-2000	N/A

PCT	Between 2000-2000	N/A
PCT	Between 2000-2000	On
PCT	N/A	After
PCT	N/A	Before
PCT	N/A	Between 1999-2000
PCT	N/A	Between 2000-2000
PCT	N/A	On
PCT	On	Before
PCT	On	N/A
US	After	Between 1999-2000
US	After	N/A
US	Before	After
US	Before	N/A
US	Between 1999-2000	Between 2000-2000
US	Between 1999-2000	N/A
US	Between 2000-2000	N/A
US	Between 2000-2000	On
US	N/A	After
US	N/A	Before
US	N/A	Between 1999-2000
US	N/A	Between 2000-2000
US	N/A	On
yUS	On	Before
US	On	N/A

Corporate Documents, Multiple Categories (phase 3 and 4)

Disclosure Date	Publication Date
After	Between 1999-2000
After	N/A
Before	After
Before	N/A
Between 1999-2000	Between 2000-2000
Between 1999-2000	N/A
Between 2000-2000	N/A
Between 2000-2000	On
N/A	After
N/A	Before
N/A	Between 1999-2000
N/A	Between 2000-2000
N/A	On
On	Before
On	N/A

Miscellaneous Search Tests (phase 2, 3 and 4)

Test Description
All documents, simple search based on title
All documents, simple search based on text
All documents, simple search based on title and text, match = any
All documents, simple search based on title and text, match = all
Save and load search