38

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Editor

Harold Lewis

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System configuration report

con is a shell script that gathers what I consider the most important system information about an AIX machine and produces a report that can be printed or kept for later use.

The variable *vpd* must be changed to the name of a file into which the report is to be written.

I hope **con** runs on all AIX systems without further changes. If you run into problems with special configurations or hardware, you should be able to change **con** to suit your needs.

Note that part of a sample report appears later to give you a flavour of the output of this utility.

CON

```
#!/bin/ksh
#*======================================================================*/
#* Name        :  con                                                   */
#*======================================================================*/
#* Created     :  by A Lauper                                           */
#*                August 1998                                           */
#*                                                                      */
#* Usage       :  shell script                                          */
#*                                                                      */
#* Arguments   :  -                                                     */
#*                                                                      */
#* Result      :  -                                                     */
#*                                                                      */
#* Function    :  Create AIX system configuratin overview report        */
#*                                                                      */
#*======================================================================*/

# Define Variables
HO=`uname -n`
vpd="/usr/efvlogs/$HOSTNAME.cfg"
export PATH=$PATH:/usr/sbin/
rev=`tput rev`
bold=`tput bold`
off=`tput sgr0`

echo ==========================================================================
>$vpd
```

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```
banner $HO >>$vpd
echo ================================================================
>>$vpd
banner ' System' >> $vpd
echo ================================================================
>>$vpd
banner Overview >>$vpd
echo ================================================================
>>$vpd
echo System Configuration Overview >>$vpd
date >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo Hostname>> $vpd
echo $HO >>$vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo TCP/IP-Address for Adapter en0>> $vpd
host $HO| awk '/[0-9]+\.[0-9]+\./ {print$3}' >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo Operating System>> $vpd
a2=`uname -a| cut -c1-3`
echo $a2 >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo Operating System-Level>> $vpd
oslevel >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo Timezone>> $vpd
echo $TZ | cut -c 1-8 >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
# In our environment, two types of memory are used; if you have
# other types of memory, you must expand the script

echo Memory>> $vpd
x0=0
l1=`lsattr -E -l mem0 | wc -l`
if [ $l1 -eq 2 ]
   then
     for fname in `lscfg -v | grep mem|cut -c 3-7`
     do
```


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```
          x1=`lsattr -E -l $fname | grep goodsize | cut -c 9-12`
          x0=`expr $x0 + $x1`
     done
   else
     for fname in `lscfg -v | grep mem|cut -c 3-7`
     do
          x1=`lsattr -E -l $fname | grep size | cut -c 8-10`
          x0=`expr $x0 + $x1`
     done
fi
echo "Total $x0 MB Real-Memory" >>$vpd
echo >> $vpd
echo ==================================================================
>>$vpd
echo Current TTYs  >> $vpd
lsdev -C -c tty -H  >> $vpd
echo >> $vpd
echo ==================================================================
>>$vpd
echo Current Users >> $vpd
who >> $vpd
echo >> $vpd
echo >> $vpd
echo ==================================================================
>>$vpd
echo ==================================================================
>>$vpd
echo Devices >> $vpd
echo >> $vpd
echo Defined Devices >> $vpd
echo >> $vpd
lsdev -C |sort -d -f >> $vpd
echo >> $vpd
echo ==================================================================
>>$vpd
l2=`lsdev -Cc adapter | grep -c ascsi`
if [ $l2 -gt 0 ]
   then
     echo Device Configuration SCSI Adapter>> $vpd
     echo >> $vpd
     x2=`lsdev -Cc adapter | grep ascsi|grep Adapter | cut -c 1-6`
     lsattr -E -l "$x2" >> $vpd
echo >> $vpd
fi
echo ==================================================================
>>$vpd
echo Current Filesystem Structure >> $vpd
echo >> $vpd
lsfs >> $vpd
echo >> $vpd
```

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```
lsvg -l `lsvg` >>$vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo Current Logical Volumes >> $vpd
echo >> $vpd
lsvg -o|lsvg -i -l >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo Disks >> $vpd
echo >> $vpd
getlvodm -C >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
lsdev -Cc disk > /tmp/DISK1
cat /tmp/DISK1 | cut -c1-7 > /tmp/DISK2
cat /tmp/DISK2 | while read var1
do
     echo Status $var1 >> $vpd
     echo >> $vpd
     lspv $var1 >> $vpd
     echo >> $vpd
echo ================================================================
>>$vpd
     echo Disk Usage $var1 >> $vpd
     echo >> $vpd
     lspv -p $var1 >> $vpd
     echo >> $vpd
     echo >> $vpd
done
echo ================================================================
>>$vpd
echo ================================================================
>>$vpd
echo >> $vpd
     echo Tape Drives >> $vpd
echo >> $vpd
if [ -r /dev/rmt0 ]
   then
     echo Current Tape-Drives >> $vpd
     echo >> $vpd
     lsdev -C -c tape -H >> $vpd
     echo >> $vpd
fi
echo ================================================================
>>$vpd
if [ -r /dev/rmt0 ]
   then
```


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```
     echo Device Configuration for Tape>> $vpd
     echo >> $vpd
     lsattr -E -l rmt0 >> $vpd
     echo >> $vpd
     echo >> $vpd
fi
echo ================================================================
>>$vpd
echo ================================================================
>>$vpd
echo Subsystems >> $vpd
echo >> $vpd
echo list active Subsystems >> $vpd
echo >> $vpd
lssrc -a | grep active >> $vpd
echo >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo ================================================================
>>$vpd
echo >> $vpd
echo Crontab for root on host $HO >>$vpd
echo >> $vpd
crontab -l|sed /^\#/d >>$vpd
echo >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo ================================================================
>>$vpd
echo >> $vpd
echo Login Information on host $HO >>$vpd
echo >> $vpd
echo Definde User >> $vpd
echo >> $vpd
lsuser -c -a id home ALL | sed '/^#.*/d' | tr ':' '\011' >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo Defined Groups >> $vpd
echo >> $vpd
lsgroup -c ALL | sed '/^#.*/d' | tr ':' '\011' >> $vpd
echo >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo ================================================================
>>$vpd
echo >> $vpd
```

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```
echo Boot Information on host $HO >>$vpd
echo >> $vpd
echo Uptime >> $vpd
echo >> $vpd
uptime >>$vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo Kernel >> $vpd
echo >> $vpd
ls -al /usr/lib/boot/unix_*  >>$vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo Last boot information >> $vpd
echo >> $vpd
cat /var/adm/ras/bootlog  >>$vpd
echo >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo Initialization process at boot time >> $vpd
echo >> $vpd
cat /etc/inittab|sed /^\:/d  >>$vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo Pagingspace Size >> $vpd
echo >> $vpd
lsps -a >> $vpd
echo >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo ================================================================
>>$vpd
echo >> $vpd
echo Network Information on host $HO >>$vpd
echo >> $vpd
echo Defined Network Interfaces >> $vpd
echo >> $vpd
lsdev -C -c if -F "name description" | sort >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo Available Network Interfaces >> $vpd
echo >> $vpd
lsdev -C -c if |grep Available| sort >> $vpd
echo >> $vpd
echo ================================================================
```


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```
>>$vpd
echo Network Interface Info >> $vpd
echo >> $vpd
for fname in `lsdev -C -c if |grep Available|grep -v ^fi| cut -c 1-3`
   do
      ifconfig $fname >> $vpd
   done
echo >> $vpd
echo ================================================================
>>$vpd
echo Ethernet Statistics and HW Addresses >> $vpd
echo >> $vpd
netstat -v >>$vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo List Routing-Table >> $vpd
echo >> $vpd
netstat -rn >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo List /etc/hosts >> $vpd
echo >> $vpd
hostent -S >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo List /etc/services >> $vpd
echo >> $vpd
cat /etc/services|sed /^\#/d >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo List active part of /etc/inetd.conf >> $vpd
echo >> $vpd
cat /etc/inetd.conf|sed /^\#/d >> $vpd
echo >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo ================================================================
>>$vpd
echo >> $vpd
c1=`mount|grep nfs|wc -l`
if [ $c1 -gt 0 ]
  then
    echo NFS Information on host $HO >>$vpd
    echo >> $vpd
    echo NFS-Mounts >> $vpd
```

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```
    echo >> $vpd
    mount | grep nfs >>$vpd
    echo >> $vpd
    echo
================================================================== >>$vpd
fi
c2=`cat /etc/exports|wc -l`
if [ $c2 -gt 0 ]
  then
    echo Exported-NFS Directories >> $vpd
    echo >> $vpd
    cat /etc/exports >>$vpd
    echo >> $vpd
    echo >> $vpd
fi
echo ================================================================
>>$vpd
echo ================================================================
>>$vpd
echo >> $vpd
echo Printer Information on host $HO >>$vpd
echo >> $vpd
echo Printer Configuration >> $vpd
echo >> $vpd
cat /etc/qconfig|sed /^\*/d >> $vpd
echo >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo ================================================================
>>$vpd
echo >> $vpd
echo Software Information on host $HO >>$vpd
echo >> $vpd
echo Installed Software >> $vpd
echo >> $vpd
lslpp -l >> $vpd
echo >> $vpd
echo >> $vpd
echo ================================================================
>>$vpd
echo End of report!! >> $vpd
date >> $vpd
echo "$bold >>>>>>$off $rev The report was written to $vpd$off $bold
<<<<<$off"
echo ================================================================
>>$vpd
# Remove temporary files
/usr/bin/rm /tmp/DISK1
/usr/bin/rm /tmp/DISK2
```


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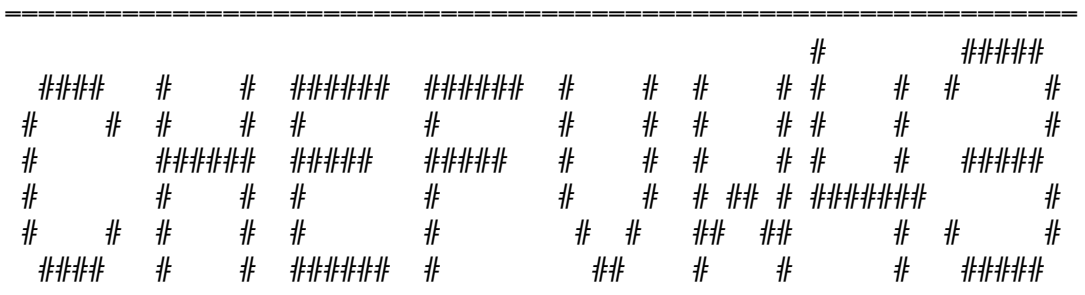

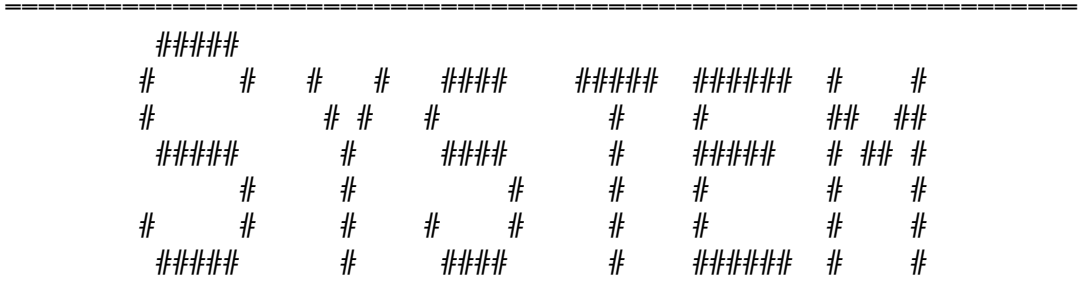

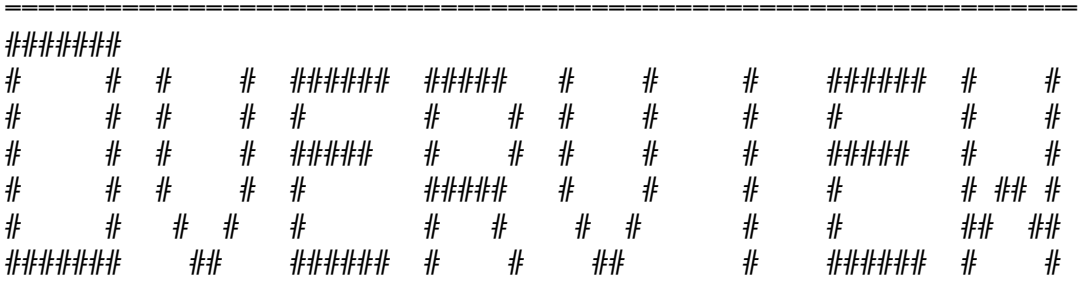

System Configuration Overview
Wed Aug 12 13:11:20 DFT 1998

Hostname
chefvw43

TCP/IP-Address for Adapter en0
131.102.22.84,

Operating System
AIX

Operating System-Level
4.3.0.0

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```
Timezone
NFT-1DFT

================================================================================
Memory
Total 64 MB Real-Memory

================================================================================
Current TTYs
name status    location    description

tty0 Available 01-C0-00-00 Asynchronous Terminal

================================================================================
Current Users
root        lft0        Aug 06 14:37
root        pts/2       Aug 12 11:34    (chefvw43)

================================================================================
================================================================================
Devices

Defined Devices

aio0       Defined                Asynchronous I/O
bus0       Available 00-00        PCI Bus
bus1       Available 04-A0        ISA Bus
bus2       Available 04-D0        PCI Bus
cd0        Available 04-C0-00-3,0 SCSI Multimedia CD-ROM Drive
en0        Available              Standard Ethernet Network I'face
ent0       Available 04-B0        IBM PCI Ethernet Adapter (22100020)
et0        Defined                IEEE 802.3 Ethernet Network I'face
fd0        Available 01-H0-00-00  Diskette Drive
fda0       Available 01-H0        Standard I/O Diskette Adapter
gxme0      Available              Graphics Data Transfer Assist Subsys
hd1        Defined                Logical volume
hd2        Defined                Logical volume
hd3        Defined                Logical volume
hd4        Defined                Logical volume
hd5        Defined                Logical volume
hd6        Defined                Logical volume
hd8        Defined                Logical volume
hd9var     Defined                Logical volume
hdisk0     Available 04-C0-00-4,0 16 Bit SCSI Disk Drive
iga0       Available 04-01        GXT110P Graphics Adapter
inet0      Available              Internet Network Extension
kbd0       Available 01-F0-00-00  PS/2 keyboard
L2cache0   Available 00-00        L2 Cache
lft0       Available              Low Function Terminal Subsystem
lo0        Available              Loopback Network Interface
```


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```
lvdd       Available              LVM Device Driver
lv_docu    Defined                Logical volume
lv_info    Defined                Logical volume
lv_logs    Defined                Logical volume
mem0       Available 00-00        Memory
mouse0     Available 01-G0-00-00  3 button mouse
paud0      Available 01-E0        Ultimedia Integrated Audio
pmc0       Available 01-I0        Power Management Controller
ppa0       Available 01-B0        Standard I/O Parallel Port Adapter
proc0      Available 00-00        Processor
pty0       Available              Asynchronous Pseudo-Terminal
rcm0       Available              Rendering Context Manager Subsystem
rootvg     Defined                Volume group
```

... several more pages of the report ...

```
================================================================
End of report!!
Wed Aug 12 13:11:30 DFT 1998
================================================================
```

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System Programmer (Switzerland)
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Performance reports

This article describes an Excel 97 utility we created to automate our RS/6000 performance monitoring. The system was designed with a certain amount of flexibility in mind, though it was specifically targeted at the production of AIX system performance reports.

The application currently produces three different types of report, all of which are controlled by Excel worksheet entries. The three report types are:

1 Weekly/daily summary workbooks (using daily data)

2 Monthly summary workbooks (using **sar** averaged data)

3 Individual report workbooks (using daily data).

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From now on the three reports will be referred to as *daily*, *monthly*, and *individual* respectively. Figure 1 shows a sample monthly report, and Figure 2 shows a sample daily report.

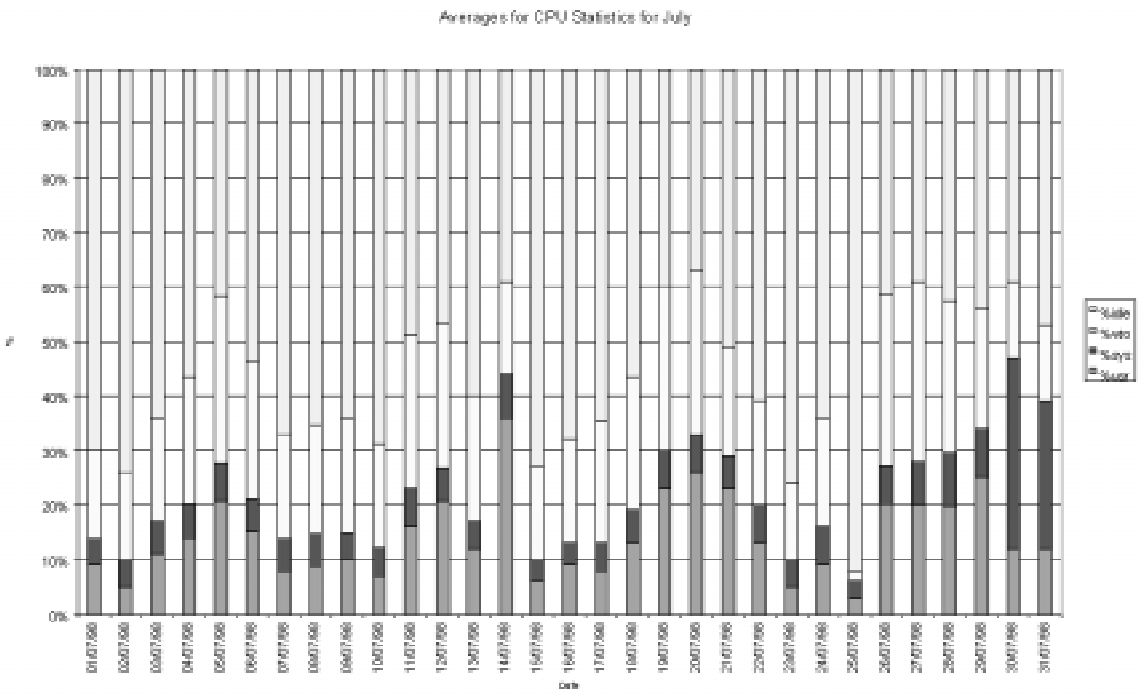

Figure 1: Monthly report

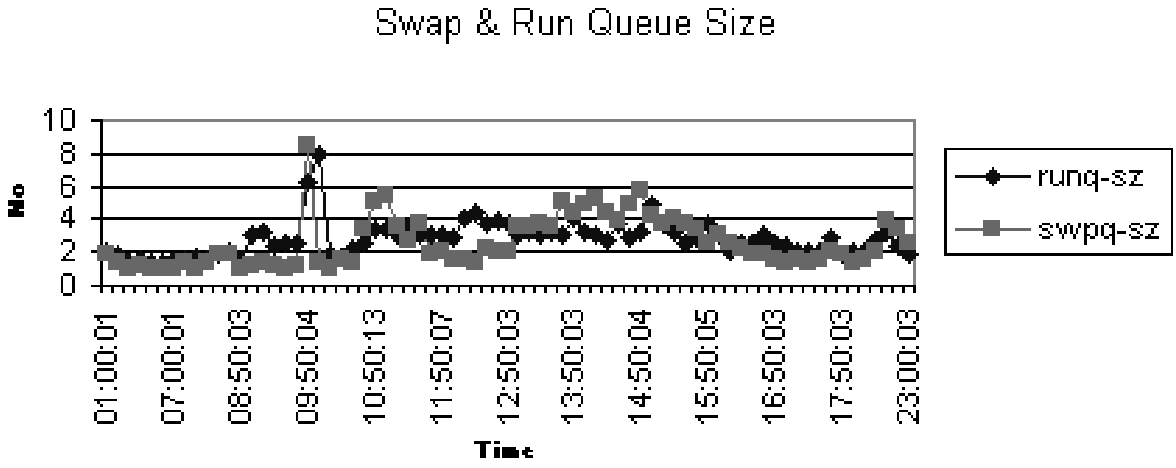

Figure 2: Daily report

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This article follows on from the Korn shell scripts described in *AIX Update* Issues 28 and 29. The Excel utility presented here relies on those performance statistics collection scripts. The utility is geared towards the production of daily, weekly, and monthly reports on AIX using **sar** information. There is an extension to the collection scripts to include commands such as **iostat** and **vmstat**, and this will be described later. These formatting changes bring the resulting text files into the correct format. Therefore this article is in the following order:

1 Changes to the collection scripts

2 Excel 97 VBA macros

3 Set up of the Excel application

4 Using the Excel application.

CHANGES TO THE COLLECTION SCRIPTS

The scripts described in *AIX Update* issues 28 and 29 that are required for this application are:

1 **control_load**

2 **format**

3 **control_load_command**

4 **format_command_output**.

For a fuller explanation on setting up these scripts, please refer to the issues of *AIX Update* mentioned above, as the success of this Excel application relies on their proper use.

The **control_load** and **format** scripts are used to format **sar** files that are created in the directory */var/adm/sa* on AIX systems. The only change required is in the **format** script – the following line:

```
sar $2 -f $SAR_REPORTS/sa${SAR_DATE} > $FORMLOG
```

needs to be changed to:

```
sar $2 -f $SAR_REPORTS/sa${SAR_DATE}|grep -v "Operating System
   is restarting." >$FORMLOG
```

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This is required to remove the ‘Operating System is restarting’ entry from the file */var/adm/sa/sadd* (this entry results from the AIX system being rebooted). Check the entry that exists in your own **sar** files to confirm the format of this line. If the line ‘Operating system is restarting’ is present in the files, the application will not chart the data properly. It is also worth noting that you cannot currently run both the **control_load** and **control_load_command** scripts at the same time. This is because they use the same data files to build the text files. If you require them to run at the same time, then change the data files in the **control_load** and **format** scripts to the following:

Global changes to both scripts:

1 change *datafile1* to *datafile5*

2 change *datafile2* to *datafile6*

3 change *datafile3* to *datafile7*

4 change *datafile4* to *datafile8*.

control_load_command and **format_command_output** require more changes to bring them in line with the required application format. The major changes are to add a header line to the output file and to standardize the date and time in the files. The scripts appear in their new format here. (Note the use of the continuation character, ‘➤’, to indicate that a single line of code maps to more than one line of print.)

CONTROL_LOAD_COMMAND

```
#!/bin/ksh

HOME=/usr/home/it032x
VMFILE=$HOME/system_stats/vmfile
IOFILE=$HOME/system_stats/iofile
PSFILE=$HOME/system_stats/psfile
HOURMIN=`date +"%H%M`
HM_ENTRY=`date +"%H:%M"`

STR_LOOP=$1

vmstat 5 2|tail -1 >$VMFILE &
lsps -a |grep -v Physical|awk '{print $1","$2","$3","$4","$5}'>
```


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```
➤  $PSFILE &
iostat -d 30 2 >$IOFILE

if [[ "$STR_LOOP" = "-zz" ]]
then
  STR_LOOP="p f s m t i a j"
  #STR_LOOP="p f w c s m k t i a j"
fi
for i in $STR_LOOP
do

#  print " $i started `date +"%H:%M"`"

  $HOME/format_command_output $i "$HOURMIN" "$HM_ENTRY"

#  print " $i completed `date +"%H:%M"`"

done

rm -f $VMFILE
rm -f $IOFILE
rm -f $PSFILE
#end
```

FORMAT_COMMAND_OUTPUT

```
#!/bin/ksh

DATA_HOME=/usr/home/it032x/system_stats
MACHINE_ID="IW"
FORMLOG=${DATA_HOME}/form1
VMFILE=$DATA_HOME/vmfile
IOFILE=$DATA_HOME/iofile
PSFILE=$DATA_HOME/psfile

VAR_SPLIT=`date +"%y%j %d %d\/%m\/%Y`
YEAR_JUL=`echo $VAR_SPLIT|awk '{print $1}'`
SAR_DATE=`echo $VAR_SPLIT|awk '{print $2}'`
YES_DATE=`echo $VAR_SPLIT|awk '{print $3}'`
HOURMIN=$2 #`date +"%H%M`
HM_ENTRY=$3 #`date +"%H:%M"`

testfile ()
{
if [[ ! -s $VMFILE ]]
then
  print "vm file is missing or not complete "
  exit 2
fi
```

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```
}
testfileio ()
{
if [[ ! -s $IOFILE ]]
then
  print "io file is missing or not complete "
  exit 2
fi
}
testfileps ()
{
if [[ ! -s $PSFILE ]]
then
  print "ps file is missing or not complete "
  exit 2
fi
}
header_for_new_file()
{
case "$1" in
  p)
  print "Key,Date,Time,%CPU,UID,Command,PID,PPID,Cpu Time,
  ➤  Elapsed Time,VSZ,Long Command">$PASSED
  ;;
  f)
  print "Key,Date,Time,Filesystem,Total KB,Used KB,Total Inodes,
  ➤  Used Inodes">$PASSED
  ;;
  c)
  print "Key,Date,Time,User,Sys,Idle,Wait">$PASSED
  ;;
  s)
  print "Key,Date,Time,List,Paged In,Paged Out,Freed,Scanned,Cycles">
  ➤  $PASSED
  ;;
  m)
  print "Key,Date,Time,Virtual Pages,Free">$PASSED
  ;;
  k)
  print "Key,Date,Time,run queue,wait queue">$PASSED
  ;;
  t)
  print "Key,Date,Time,Device Intrpts,Sys calls,Kernal Thread">$PASSED
  ;;
  w)
  print "Key,Date,Time">$PASSED
  ;;
  i)
  print "Key,Date,Time,Disk,%tm_act,Kbps,tps,Kb_read,Kb_wrtn">$PASSED
  ;;
```


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```
  j)
  TEST_DISK=""
  for d in `lsdev -Cc disk|awk '{print $1}'`
  do
  TEST_DISK=$TEST_DISK",$d,$d,$d,$d,$d"
  done
  print "Key,Date,Time$TEST_DISK">$PASSED
  ;;
  a)
  print "Key,Date,Time,Page Space,Volume,VG,Size,Used">$PASSED
  ;;
  *)
  print "Not correct options"
  exit 2
  ;;
esac
}

>$DATA_HOME/Datafile2

case "$1" in
  p)
  ps -eF "%C,%u,%c,%p,%P,%x,%t,%z,%a"|grep -v "%CPU"|sort -r |
  ➤  head -5 > $FORMLOG
  ;;
  f)
  df -vk `mount|grep jfs|awk '{print $2}'`|grep -v Filesystem|
  ➤  awk '{r=$6+$7};{print $9","$2","$3","r","$6}'>$FORMLOG
  ;;
  c)
  testfile
  cat $VMFILE|awk '{print $14","$15","$16","$17}'> $FORMLOG
  ;;
  s)
  testfile
  cat $VMFILE|awk '{print $5","$6","$7","$8","$9","$10}'> $FORMLOG
  ;;
  m)
  testfile
  cat $VMFILE|awk '{print $3","$4}'> $FORMLOG
  ;;
  k)
  testfile
  cat $VMFILE|awk '{print $1","$2}'> $FORMLOG
  ;;
  t)
  testfile
  cat $VMFILE|awk '{print $11","$12","$13}'> $FORMLOG
  ;;
  w)
```

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```
  who -u|sed "s/[ ][ ]*[ ]/,/g" > $FORMLOG
  ;;
  i)
  testfileio
  >$FORMLOG
  for i in `lsdev -Cc disk|awk '{print $1}'`
  do
  cat $IOFILE |grep -w $i |tail -1|awk '{print $1","$2","$3",
  ➤  "$4","$5","$6}'>>$FORMLOG
  done
  ;;
  j)
  testfileio
  WRITE=""
  >$FORMLOG
  for i in `lsdev -Cc disk|awk '{print $1}'`
  do
  WRITE=$WRITE`cat $IOFILE |grep -w $i |tail -1|awk '{print
  ➤  $2","$3","$4","$5","$6","}'`
  done
  print $WRITE>$FORMLOG
  ;;
  a)
  testfileps
  cat $PSFILE >$FORMLOG
  ;;
  *)
  print "Not correct options"
  exit 2
  ;;
esac

NO_LINES=`cat ${FORMLOG}|wc -l`

let TAIL_CHOP=NO_LINES
let HEAD_CHOP=TAIL_CHOP

cat ${FORMLOG}>$DATA_HOME/Datafile1

COUNT=0

while [ $COUNT -lt $HEAD_CHOP ]
do

  let ROTATE=HEAD_CHOP-COUNT
  let IDENT=COUNT+1
  KEY="k"$YEAR_JUL"."$HOURMIN$IDENT

  tail -$ROTATE $DATA_HOME/Datafile1 | head -1| sed "s/^/$KEY\,
  ➤  $YES_DATE\,$HM_ENTRY\,/g">>$DATA_HOME/Datafile2
```


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```
  let COUNT=COUNT+1

done

sed "s/ //g" $DATA_HOME/Datafile2 > $DATA_HOME/Datafile3

SEL=`echo $1|tr "[a-z]" "[A-Z]"`

  PASSED=$DATA_HOME/${MACHINE_ID}${SEL}.TXT
  header_for_new_file $1 $PASSED
  cat $DATA_HOME/Datafile3 >> $DATA_HOME/${MACHINE_ID}${SEL}.TXT

if [ ! -f $DATA_HOME/${MACHINE_ID}${SEL}`date +%b|tr "[a-z]"
➤  "[A-Z]"`.TXT ]
then
  PASSED=$DATA_HOME/${MACHINE_ID}${SEL}`date +%b|tr "[a-z]"
  ➤  "[A-Z]"`.TXT
  header_for_new_file $1 $PASSED
fi

cat $DATA_HOME/Datafile3 >> $DATA_HOME/${MACHINE_ID}${SEL}`date +%b|
➤  tr "[a-z]" "[A-Z]"`.TXT
#end
```

These four scripts need to run before the Excel application described in the rest of this article. The resulting files must be ready for access by a PC running Excel 97.

PERFORMANCE STATISTICS TEXT FILES

The **control_load** and **format** scripts produce text files using all options of the **sar** command. The only **sar** option not supported by the Excel application is **-v**, which concerns the status of processes, kernel threads, i-nodes, and file tables, whose data is not suitable for presentation in chart format. For an explanation of the structure of the text files please refer to the table in Figure 3. This table shows the columns used by Excel for the two types of file produced (**sar** daily data and **sar** averaged daily data). Use this table when creating your own charts for reports.

The **control_load_command** and **format_command_ouput** scripts produce text files using AIX system commands, such as **iostat** and **vmstat**. The only options relevant to the Excel application are:

A Paging space (**lsps**)

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File extension	sar information	Data file column	Average file column
A	iget/s	D	C
	lookuppn/s	E	D
	dirblk/s	F	E
B	bread/s	D	C
	lread/s	E	D
	%rcache	F	E
	bwrit/s	G	F
	lwrit/s	H	G
	%wcache	I	H
	pread/s	J	I
	pwrit/s	K	J
C	scall/s	D	C
	sread/s	E	D
	swrit/s	F	E
	fork/s	G	F
	exec/s	H	G
	rchar/s	I	H
	wchar/s	J	I
K	ksched/s	D	C
	kproc-ov	E	D
	kext/s	F	E
M	msg/s	D	C
	sema/s	E	D
Q	runq-sz	D	C
	%runocc	E	D
	swpq-sz	F	E
	%swpocc	G	F
R	slots	D	C
	cycle/s	E	D
	fault/s	F	E
	odio/s	G	F
U	%usr	D	C
	%sys	E	D
	%wio	F	E
	%idle	G	F
W	cswch/s	D	C
Y	rawch/s	D	C
	canch/s	E	D
	outch/s	F	E
	rcvin/s	G	F
	xmtin/s	H	G
	mdmin/s	I	H

*Figure 3: **sar** text file columns*

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J Disk information (**iostat**)

M Memory (**vmstat**)

S Paging space (**vmstat**)

T Faults (device interrupts, system calls, and kernel).

The **J** option formats **iostat**'s output on disks into one line for each collection. This means that, when used with this Excel application, it's only suitable for systems with relatively few disks, as Excel imposes a limit of 256 columns per worksheet. If your system has many disks, it's possible to add an extra collection identifier for groups of separate disks. The other possibility is to limit the collection to (for example)

File extension	Performance statistics	Data file column
A	Page space	D
	Volume	E
	Volume group	F
	Size	G
	Used	H
J*	%tm_act	D
	Kbps	E
	Tps	F
	Kb_read	G
	Kb_wrtn	H
M	Virtual pages	D
	Free	E
S	Paged in	D
	Paged out	E
	Freed	F
	Scanned	G
	Cycles	H
T	Device interrupts	D
	Sys calls	E
	Kernel thread	F

* The J file lists only the first disk columns. In the data text file, the column titles have the name of the disk – this is to distinguish the different disks. The columns repeat in the same order for each disk. As the column titles are not updated until the following month, if any disk changes are made, it is necessary to monitor the consistency of the data.

Figure 4: Performance statistics and data file columns

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the time the disk is active (*%tm_act*) – this increases the number of disks that can take part in each collection. Other collection identifiers could then be used to collect the rest of the information from **iostat** (*Kbps, tps, Kb_read, Kb_written*). Refer to *AIX Update* issues 28 and 29 for details of how this is done. (Our system uses RAID 5, which presents multiple SSA disks as one AIX system disk. This means that the number of disks on which to report is reduced, making it ideal for this script.)

For an explanation of the structure of the text files, refer to the table in Figure 4. This table details the columns used by Excel for this type of file (AIX system commands daily data files). Please use this table when creating charts for your reports. The scripts also produce other types of file that are either not compatible with the application or are already covered by **sar**-related statistics.

The application is geared towards data files comprising one line per collection. So, for example, data on filesystems collected using the **df** command would not be suitable. The application can, however, report on one filesystem as long as the rules discussed in previous issues of *AIX Update* on adding to the collection scripts are followed.

The text file produced by the **miles1** script in *AIX Update* Issue 34 is compatible with this application. If this file is used, it should be set up as a monthly report using the procedure to add averaged **sar** data files.

MACHINE_ID VARIABLE

The scripts **control_load** and **format_command_output** contain a variable called *MACHINE_ID*. It's important that the value of this variable is different in both scripts, as the two scripts produce output files with names comprising a single-letter identifier, so this variable is used to distinguish between them. If the same *MACHINE_ID* value is assigned to both scripts, then the single-letter identifiers should be changed to avoid a possible clash. The names of the data text files are created by Excel, and all files relating to each machine are in the same directory. It is therefore important not to overwrite any files. *MACHINE_ID* should also be in capitals, as it is used to hide the data worksheet (if the name is in lower case, this action cannot be taken).

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The application runs only on Excel 97 (while it was developed with Excel 5 and Excel 95 and uses much of the VBA code from these versions, it has since been changed to conform with Excel 97 VBA, which it now requires).

This article does not deal with differences between Excel versions, but concentrates on the use of the application under Excel 97. Should there be enough demand for it, I'll deal with running the application under Excel 95 in a later article.

To enable the code, open Excel 97 and start the VBA editor, enter the code below, and save the workbook as 'Graph System Data'.

For example, in Excel 97, choose the following menu options:

1 *Tools*

2 *Macros*

3 *Visual Basic Editor*

(Alternatively, use the shortcut *Alt+F11*.)

GRAPH SYSTEM DATA

```
'*********************************************************************
'*                   Graph AIX System Data
'*
'*                 Written By: Robert Russell
'*
'*                   Creates system reports
'*          Using commands such as sar, iostat and vmstat
'*
'*                   (C)1998 Robert Russell
'*
'*********************************************************************
Public AVE_DIR, AVE_FILE, CHART_TITLE, X_TITLE, Y_TITLE
Public CHART_TYPE, SAV_EXT, SAV_DIR
Public MONTH_NAME, FILE_EXT, CHART_COL, DOWN_STOP, i, MONTH_TITLE
Public PASSED, t, HOLD_DATE, CHART_SHEET
Public IT As Integer
Public SIT As Integer
Public CALC_SHEET As Worksheet
Public TEMP_SHEET As Worksheet
Public FROM_DATE, TO_DATE, FROM_TIME, TO_TIME, COLLECT, DESIGN, _
```

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```
  BOX_NAME, BOX_SUM
Public MAX_TEXT, MAX_SCALE, answer, MAX_RANGE, ROUND_UP, _
  SUMMARY_DATE, CHK, OLD_NAME
Public SUM_CT, SUM_LEFT, SUM_TOP, C_CT, C_TOP, C_LEFT
Public LAST_LEFT, LAST_DES, SPACE_CT, COPY_TO_SUM, FOOTER
Public temp As String
Public DISP, EDIT_SHEET, WORK_SHEET, LINE, ACT, NAME_SHEET, BASE, _
DISP_CON
Public BOOK_NAME
Sub gsd_runsetup()
Sheets.Add
ActiveSheet.Name = "Tempry"
Cells(4, 4).Value = "Please wait, setting up application"
Application.ScreenUpdating = False
For Each sh In ActiveWorkbook.Worksheets
        Application.DisplayAlerts = False
        If sh.Name <> "Tempry" Then
        sh.Delete
        End If
        Application.DisplayAlerts = True
    Next sh
    For Each sh In ActiveWorkbook.DialogSheets
        Application.DisplayAlerts = False
        sh.Delete
        Application.DisplayAlerts = True
    Next sh
    Sheets.Add
    ActiveSheet.Name = "Control"
    ActiveWorkbook.Names.Add Name:="Auto_Open", _
      RefersToR1C1:="=builder"
    control_sheet_text
    Cells(1, 1).Select
    Sheets.Add
    ActiveSheet.Name = "Control ME"
    control_sheet_text
    Cells(1, 1).Select
    Sheets.Add
    ActiveSheet.Name = "Calculations"
    Sheets.Add
    ActiveSheet.Name = "Data"
    Sheets.Add
    ActiveSheet.Name = "sheet5"
    box_sheet_text
    Cells(1, 1).Select
    ANS = InputBox("Enter Directory to put reports", "Report _
      Directory")
    Worksheets("Data").Cells(1, 7).Value = ANS
    Worksheets("Data").Cells(1, 8).Value = Format(Now(), "mmm")
Application.DisplayAlerts = False
Worksheets("Tempry").Delete
```


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```
Worksheets("Control").Select
Application.ScreenUpdating = True
ActiveWorkbook.Save
MsgBox "Application Worksheet Setup Complete"
End Sub
Sub control_sheet_text()
    ActiveSheet.Cells(1, 1).Value = "Sheet Machine ID"
    ActiveSheet.Cells(1, 2).Value = "Data Directory"
    ActiveSheet.Cells(1, 3).Value = "Full Box Name"
    ActiveSheet.Cells(1, 4).Value = "Summary File"
    ActiveSheet.Cells(1, 5).Value = "Report Date From"
    ActiveSheet.Cells(1, 6).Value = "Report Date To"
    ActiveSheet.Cells(1, 7).Value = "Report Time From"
    ActiveSheet.Cells(1, 8).Value = "Report Time To"
    ActiveSheet.Cells(1, 9).Value = "Load File Extension"
    ActiveSheet.Cells(1, 10).Value = "Data File Type"
    Columns("A:J").Select
    Selection.NumberFormat = "@"
    ActiveSheet.Range("A2:J2").Value = "END"
    Range("A1:J2").Select
    Selection.Font.Bold = True
    Columns("J:J").EntireColumn.AutoFit
    Range("A1").Select
    ActiveWindow.Zoom = 75
    Range("A1:J1").Select
    Selection.Font.Bold = True
    Columns("J:J").EntireColumn.AutoFit
    Range("A1").Select
    Columns("A:A").ColumnWidth = 10.57
    Columns("D:D").ColumnWidth = 10.29
    Columns("I:I").ColumnWidth = 10.14
    Columns("B:B").ColumnWidth = 29.71
    Columns("C:C").ColumnWidth = 13.71
    Columns("D:D").ColumnWidth = 22.43
    Range("A1:J1").Select
    border
End Sub
Sub box_sheet_text()
ActiveSheet.Cells(1, 1).Value = "File"
ActiveSheet.Cells(1, 2).Value = "Number Of Charts"
ActiveSheet.Cells(1, 3).Value = "Reduce Column Scale"
ActiveSheet.Cells(1, 4).Value = "Add to Save Name"
ch = 1
For i = 5 To 32 Step 9
    ActiveSheet.Cells(1, i).Value = "Name of Chart"
    ActiveSheet.Cells(1, i + 1).Value = "Columns To Chart"
    ActiveSheet.Cells(1, i + 2).Value = "X axis Title"
    ActiveSheet.Cells(1, i + 3).Value = "Y axis title"
    ActiveSheet.Cells(1, i + 4).Value = "Type of Chart"
    ActiveSheet.Cells(1, i + 5).Value = "Design Type"
```

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```
    ActiveSheet.Cells(1, i + 6).Value = "Footer Text"
    ActiveSheet.Cells(1, i + 7).Value = "Standard Scale"
    ActiveSheet.Cells(1, i + 8).Value = "Round Up Max Scale"
    ActiveSheet.Range(Cells(4, i), Cells(4, i + 8)).Select
    Selection.Merge
    ActiveCell.FormulaR1C1 = "Chart " & ch
    ch = ch + 1
Next i
    Range("A1:AN1").Select
    Selection.Font.Bold = True
    Range("A1").Select
    ActiveWindow.Zoom = 75
    Range("A1:AN1").Select
    border
End Sub
Sub border()
    With Selection
        .HorizontalAlignment = xlGeneral
        .VerticalAlignment = xlBottom
        .WrapText = True
    End With
    Selection.Borders(xlDiagonalDown).LineStyle = xlNone
    Selection.Borders(xlDiagonalUp).LineStyle = xlNone
    With Selection.Borders(xlEdgeLeft)
        .LineStyle = xlDouble
        .Weight = xlThick
        .ColorIndex = xlAutomatic
    End With
    With Selection.Borders(xlEdgeTop)
        .LineStyle = xlDouble
        .Weight = xlThick
        .ColorIndex = xlAutomatic
    End With
    With Selection.Borders(xlEdgeBottom)
        .LineStyle = xlDouble
        .Weight = xlThick
        .ColorIndex = xlAutomatic
    End With
    With Selection.Borders(xlEdgeRight)
        .LineStyle = xlDouble
        .Weight = xlThick
        .ColorIndex = xlAutomatic
    End With
    With Selection.Borders(xlInsideVertical)
        .LineStyle = xlDouble
        .Weight = xlThick
        .ColorIndex = xlAutomatic
    End With
    With Selection
        .HorizontalAlignment = xlCenter
```


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```
        .VerticalAlignment = xlBottom
        .WrapText = True
    End With
End Sub
Sub add_next_line()
    Cells(1, 1).Select
    LINE = Selection.End(xlDown).Row
    Rows(LINE & ":" & LINE).Select
    Selection.Insert Shift:=xlDown
    Cells(LINE - 1, 1).Select
End Sub
Sub add_next_line_gsd()
    Cells(1, 1).Select
    If Cells(2, 1).Value <> "" Then
        LINE = Selection.End(xlDown).Row + 1
        Rows(LINE & ":" & LINE).Select
        Selection.Insert Shift:=xlDown
        Cells(LINE - 1, 1).Select
    Else
        LINE = 2
        Rows(LINE & ":" & LINE).Select
        Selection.Insert Shift:=xlDown
        Cells(LINE - 1, 1).Select
    End If
End Sub
Sub ending()
End
End Sub
Sub auto_starter()
MsgBox "Start"
builder
End Sub
Sub builder()
    SAV_DIR = Worksheets("Data").Cells(1, 7).Value _
      'C:\sysdata\data\excel books\"
    If Format(Now(), "mmm") <> Worksheets("Data").Cells(1, 8).Value _
      Then
        CONTROL_SHEET = "Control ME"
        Worksheets("Data").Cells(1, 8).Value = Format(Now(), "mmm")
    Else
        CONTROL_SHEET = "Control"
    End If
    Set TEMP_SHEET = Worksheets("Calculations")
    Worksheets(CONTROL_SHEET).Activate
    Cells(2, 1).Select
    Set A_CELL = ActiveCell
    Do While A_CELL.Value <> "END"
    LAST_DES = 0
    SPACE_CT = 0
    COLLECT = ActiveCell.Value '"tplive"
```

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```
FROM_DATE = Format(Now() - ActiveCell.Offset(0, 4).Value, _
  "dd/mm/yy")
If ActiveCell.Offset(0, 5).Value <> "ALL" Then
    TO_DATE = Format(Now() - ActiveCell.Offset(0, 5).Value, _
      "dd/mm/yy")
    SUMMARY_DATE = TO_DATE
Else
    TO_DATE = "ALL"
End If
CHK = "Y"
FROM_TIME = ActiveCell.Offset(0, 6).Value '"00:15"
TO_TIME = ActiveCell.Offset(0, 7).Value '"23:59"
Application.ScreenUpdating = False
If TO_DATE <> "ALL" Then
    MONTH_NAME = Format(FROM_DATE, "mmm")
    MONTH_TITLE = Format(FROM_DATE, "mmmm")
Else
    MONTH_NAME = Format(FROM_DATE, "mmm")
    MONTH_TITLE = Format(FROM_DATE, "mmmm")
End If
PASSED = 2
SUM_CT = 0
    AVE_DIR = ActiveCell.Offset(0, 1).Value _
      '"C:\sysdata\data\manlive\"
    BOX_NAME = ActiveCell.Offset(0, 2).Value '"Manugistics"
    BOX_SUM = ActiveCell.Offset(0, 3).Value '"Manugistics Summary"
    FILE_EXT = ActiveCell.Offset(0, 8).Value '".TXT"
    SAV_EXT = ActiveCell.Offset(0, 9).Value '"DAT"
    Set CALC_SHEET = Worksheets(COLLECT)
    CALC_SHEET.Select
If BOX_SUM <> "None" Then
    tidy_summary
End If
LAST_LOOP = CALC_SHEET.Cells(1, 1).End(xlDown).Row
SUM_LEFT = 1.75
SUM_TOP = 1.75
For i = 2 To LAST_LOOP
    Windows("Graph System Data.xls").Activate
    AVE_FILE = CALC_SHEET.Cells(i, 1).Value
    open_data_file
    graph_data
    save_out_book
Next i
If BOX_SUM <> "None" Then
    Windows(BOX_SUM).Activate
    hide_sheets
    For Each sh In ActiveWorkbook.Worksheets
    If sh.Visible Then
        sh.Select
        ActiveSheet.Cells(1, 1).Select
```


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```
        End If
        Next sh
        '******************Margin Setup, enables page to fit printer
        Application.DisplayAlerts = False
        ActiveWorkbook.Save
        ActiveWorkbook.Close
        Application.DisplayAlerts = False
    End If
    Worksheets(CONTROL_SHEET).Select
    ActiveCell.Offset(1, 0).Select
        Set A_CELL = ActiveCell
    Loop
Application.DisplayAlerts = False
ActiveWorkbook.Save
Application.Quit
End Sub
Sub open_data_file()
    Workbooks.OpenText FileName:=AVE_DIR & AVE_FILE & MONTH_NAME & _
      FILE_EXT, Origin:= xlWindows, StartRow:=1, _
      DataType:=xlDelimited, TextQualifier:= _
      xlDoubleQuote, ConsecutiveDelimiter:=False, Tab:=True, _
      Semicolon:=False, Comma:=True, Space:=False, Other:=False, _
      FieldInfo:=Array(Array(1, 1), Array(2, 4))
    If TO_DATE <> "ALL" Then
        If Format(TO_DATE, "mmm") <> Format(FROM_DATE, "mmm") Then
            OP = Format(TO_DATE, "mmm")
            Workbooks.OpenText FileName:=AVE_DIR & AVE_FILE & OP & _
              FILE_EXT, Origin:= xlWindows, StartRow:=1, _
              DataType:=xlDelimited, TextQualifier:= xlDoubleQuote, _
              ConsecutiveDelimiter:=False, Tab:=True, _
              Semicolon:=False, Comma:=True, Space:=False, _
              Other:=False, FieldInfo:=Array(Array(1, 1), Array(2, 4))
            Cells(2, 1).Select
            If Selection.Value <> "" Then
                BOT_T = Selection.End(xlDown).Row
                Cells(2, 1).Select
                BOT_R = Selection.End(xlToRight).Column
                Range(Cells(2, 1), Cells(BOT_T, BOT_R)).Select
                Selection.Copy
                Windows(AVE_FILE & MONTH_NAME & FILE_EXT).Activate
                Cells(1, 1).Select
                BOT_T = Selection.End(xlDown).Row + 1
                Cells(BOT_T, 1).Select
                ActiveSheet.Paste
                Application.CutCopyMode = False
                Cells(1, 1).Select
                Windows(AVE_FILE & OP & FILE_EXT).Activate
                Application.DisplayAlerts = False
                ActiveWorkbook.Close
            Else
```

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```
                Application.DisplayAlerts = False
                ActiveWorkbook.Close
                Cells(1, 1).Select
            End If
        End If
    End If
    Cells(1, 2).Select
    If SAV_EXT = "DAT" Then
        auto_sort
    Else
    If BOX_SUM <> "None" And SAV_EXT = "AVE" Then
    Sheets(AVE_FILE & MONTH_NAME & "A").Copy Before:= _
      Workbooks(BOX_SUM).Sheets(1)
    End If
    End If
    Cells(2, 2).Select
    If Selection.Value <> "" Then
    If Cells(3, 2).Value = "" Then
        DOWN_STOP = 2
        RIGHT_STOP = Selection.End(xlToRight).Column
    Else
        DOWN_STOP = Selection.End(xlDown).Row
        RIGHT_STOP = Selection.End(xlToRight).Column
    End If
    If SAV_EXT = "AVE" Then
        MAX_RANGE = DOWN_STOP
    End If
    Else
        MsgBox "No data selected please check range of dates"
        End
    End If
    reduce_columns
End Sub
Sub reduce_columns()
HOLD = CALC_SHEET.Cells(i, 3).Value
If HOLD <> "" Then
c = 1
CHAR = Mid(HOLD, c, 1)
Do While c < Len(HOLD)
    Do Until CHAR = "1" Or CHAR = "0" Or c = (Len(HOLD) + 1)
        If CHAR <> "," Then
        COL = COL & CHAR
        End If
        c = c + 1
        CHAR = Mid(HOLD, c, 1)
    Loop
    Do Until CHAR = "," Or c = (Len(HOLD) + 1)
        NUM = NUM & CHAR
        c = c + 1
        CHAR = Mid(HOLD, c, 1)
```


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```
    Loop
TEMP_RANGE = COL & "2:" & COL & DOWN_STOP
TEMP_SHEET.Range(TEMP_RANGE).Value = NUM
TEMP_SHEET.Range(TEMP_RANGE).Copy
Range(TEMP_RANGE).Select
    Selection.PasteSpecial Paste:=xlAll, Operation:=xlDivide, _
      SkipBlanks:= False, Transpose:=False
COL = ""
NUM = ""
Loop
End If
Application.CutCopyMode = False
End Sub
Sub save_out_book()
    SAV_BOOK = AVE_FILE & MONTH_NAME & FILE_EXT
    Application.StatusBar = "Closing " & AVE_FILE & MONTH_NAME _
      & FILE_EXT
    Windows(SAV_BOOK).Activate
    Application.DisplayAlerts = False
    If BOX_SUM = "None" Then
    D_EXT = CALC_SHEET.Cells(i, 4).Value
    Application.StatusBar = "Saving " & AVE_FILE & SAV_EXT & D_EXT
    ActiveWorkbook.SaveAs FileName:=SAV_DIR & AVE_FILE & SAV_EXT _
      & D_EXT, FileFormat:=xlNormal, Password:="", _
      WriteResPassword:="", ReadOnlyRecommended:=False, _
      CreateBackup:=False
    End If
    ActiveWorkbook.Close
    Application.StatusBar = "Finished close"
    Application.DisplayAlerts = True
End Sub
Sub graph_data()
    FIL = AVE_FILE & MONTH_NAME & FILE_EXT
    CHART_SHEET = Mid(FIL, 1, (Len(FIL) - 4))
    Windows("Graph System Data.xls").Activate
    LOOPS = CALC_SHEET.Cells(i, 2).Value * 9 + 5 - 9
    C_LEFT = -140.25
    C_TOP = -70.5
    For l = 5 To LOOPS Step 9
        Windows("Graph System Data.xls").Activate
        CHART_TITLE = BOX_NAME & " System Data for " & _
          CALC_SHEET.Cells(i, l).Value
        SUM_TITLE = CALC_SHEET.Cells(i, l).Value
        CHART_SHEET_NAME = CALC_SHEET.Cells(i, l).Value
        CHART_COL = CALC_SHEET.Cells(i, l + 1).Value
        X_TITLE = CALC_SHEET.Cells(i, l + 2).Value
        Y_TITLE = CALC_SHEET.Cells(i, l + 3).Value
        CHART_TYPE = CALC_SHEET.Cells(i, l + 4).Value
        DESIGN = CALC_SHEET.Cells(i, l + 5).Value
        FOOTER = CALC_SHEET.Cells(i, l + 6).Value
```

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```
    STAN_SCALE = CALC_SHEET.Cells(i, l + 7).Value
    ROUND_UP = CALC_SHEET.Cells(i, l + 8).Value
If BOX_SUM = "None" Then
    Windows(CHART_SHEET).Activate
    Worksheets.Add
    TEMPA = "Chart Data " & AVE_FILE & MONTH_NAME
Else
    Windows(BOX_SUM).Activate
    If SAV_EXT = "DAT" Then
    Worksheets.Add
    End If
End If
If SAV_EXT = "DAT" Then
    ActiveSheet.Name = CHART_SHEET_NAME
End If
Do While PASSED < DOWN_STOP
If BOX_SUM = "None" Then
    Worksheets(CHART_SHEET).Select
    Worksheets("Chart Data " & AVE_FILE & MONTH_NAME).Select
Else
    If SAV_EXT = "DAT" Then
    Worksheets("Chart Data " & AVE_FILE & MONTH_NAME).Select
    Else
    Worksheets(AVE_FILE & MONTH_NAME & "A").Select
    End If
End If
    select_cols
Charts.Add
If SAV_EXT = "DAT" Then
    ActiveChart.Location Where:=xlLocationAsObject, _
      Name:=CHART_SHEET_NAME
Else
    ActiveChart.Location Where:=xlLocationAsNewSheet
    ActiveSheet.Name = CHART_SHEET_NAME
End If
    ActiveChart.ChartType = xlLineMarkers
With ActiveChart.PageSetup
    .CenterHeader = BOX_NAME & " System Data for " & _
       CHART_SHEET_NAME
    .Orientation = xlLandscape
    .PaperSize = xlPaperA4
    .CenterFooter = FOOTER
End With
    ActiveChart.ChartArea.AutoScaleFont = False
With ActiveChart
    .HasTitle = True
    If SAV_EXT = "DAT" Then
    .ChartTitle.Characters.Text = Format(HOLD_DATE, "ddd") & _
      " " & HOLD_DATE
    Else
```


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```
    .ChartTitle.Characters.Text = "Averages for " & _
      CHART_SHEET_NAME & " for " & MONTH_TITLE
    End If
    .Axes(xlCategory, xlPrimary).HasTitle = True
    .Axes(xlCategory, xlPrimary).AxisTitle.Characters.Text = _
      X_TITLE
    .Axes(xlValue, xlPrimary).HasTitle = True
    .Axes(xlValue, xlPrimary).AxisTitle.Characters.Text = Y_TITLE
End With
Application.StatusBar = CHART_TITLE & " " & HOLD_DATE
ActiveChart.Axes(xlCategory).TickLabels.Orientation = xlUpward
format_chart
If CHART_TYPE = "xlColumnStacked100" Then
    ActiveChart.ChartType = xlColumnStacked100
End If
If CHART_TYPE = "xlLineMarkers" Then
    ActiveChart.ChartType = xlLineMarkers
End If
If CHART_TYPE = "xlColumnStacked" Then
    ActiveChart.ChartType = xlColumnStacked
End If
If CHART_TYPE = "xlLineStacked" Then
    ActiveChart.ChartType = xlLineStacked
End If
    If STAN_SCALE = "Y" Then
        With ActiveChart.Axes(xlValue)
            .MinimumScale = 0
            .MaximumScale = MAX_SCALE
            .MinorUnitIsAuto = True
            .MajorUnitIsAuto = True
            .Crosses = xlAutomatic
        End With
    End If
C_CT = C_CT + 1
IT = 0
ACT_CHART = "Chart " & C_CT
IT = (C_CT / 2)
IT = IT * 2
If SAV_EXT <> "AVE" Then
If DESIGN = 1 Then
ActiveSheet.Shapes(ACT_CHART).ScaleWidth 1.17, msoFalse, _
  msoScaleFromTopLeft
ActiveSheet.Shapes(ACT_CHART).IncrementLeft C_LEFT
ActiveSheet.Shapes(ACT_CHART).IncrementTop C_TOP
If IT <> C_CT Then
    C_LEFT = 195
Else
    C_TOP = C_TOP + 148
    C_LEFT = -140.25
    If C_CT = 6 Or C_CT = 12 Or C_CT = 18 Or C_CT = 24 Or _
```

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```
          C_CT = 30 Then
            C_TOP = C_TOP + 2
        End If
    End If
    Else
    ActiveSheet.Shapes(ACT_CHART).ScaleWidth 2.335, msoFalse, _
      msoScaleFromTopLeft
    ActiveSheet.Shapes(ACT_CHART).IncrementLeft C_LEFT
    ActiveSheet.Shapes(ACT_CHART).IncrementTop C_TOP
    C_TOP = C_TOP + 148
        If C_CT = 3 Or C_CT = 6 Or C_CT = 9 Or C_CT = 12 Or _
          C_CT = 15 Then
            C_TOP = C_TOP + 2
        End If
        If C_CT = 18 Or C_CT = 21 Or C_CT = 24 Or C_CT = 27 Or _
          C_CT = 30 Then
            C_TOP = C_TOP + 3
        End If
    End If
    TEMP_DATE = Format(HOLD_DATE, "dd/mm/yy")
    TIT_DATE = Format(SUMMARY_DATE, "dd.mm.yy")
    If TEMP_DATE = SUMMARY_DATE And BOX_SUM <> "None" Then
        SUM_CT = SUM_CT + 1
        SPACE_CT = SPACE_CT + 1
        ActiveChart.ChartArea.Copy
        Windows(BOX_SUM).Activate
        If CHK = "Y" Then
            Worksheets.Add
            ActiveSheet.Name = TIT_DATE & " Charts"
            CHK = "N"
        Else
            SHT = TIT_DATE & " Charts"
            Worksheets(SHT).Select
        End If
Cells(1, 1).Select
        ActiveSheet.Paste
    Application.CutCopyMode = False
    With ActiveChart
        .HasTitle = True
        .ChartTitle.Characters.Text = SUM_TITLE '& " for " & HOLD_DATE
    End With
    With ActiveChart.PageSetup
        .CenterHeader = BOX_NAME & " System Stats for " & _
          CHART_SHEET_NAME & " on " & SUMMARY_DATE
        .Orientation = xlLandscape
        .PaperSize = xlPaperA4
    End With
    With ActiveSheet.PageSetup
        .CenterHeader = BOX_NAME & " System Stats " & SUMMARY_DATE
        .LeftMargin = Application.InchesToPoints(0.75)
```


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```
        .RightMargin = Application.InchesToPoints(0.75)
        .TopMargin = Application.InchesToPoints(1)
        .HeaderMargin = Application.InchesToPoints(0.5)
        .FooterMargin = Application.InchesToPoints(0.5)
        .BottomMargin = Application.InchesToPoints(0.85)
        .Orientation = xlLandscape
        .PaperSize = xlPaperA4
        .CenterFooter = FOOTER
    End With
    SMY_CHART = "Chart " & SUM_CT
    SIT = (SUM_CT / 2)
    SIT = SIT * 2
If DESIGN = 1 Then
    ActiveSheet.Shapes(SMY_CHART).ScaleWidth 1.17, msoFalse, _
      msoScaleFromTopLeft
    ActiveSheet.Shapes(SMY_CHART).IncrementLeft SUM_LEFT
    ActiveSheet.Shapes(SMY_CHART).IncrementTop SUM_TOP
    If LAST_LEFT = 1.5 And LAST_DES = 1 Or SUM_CT = 1 Then
        SUM_LEFT = 337.75
        LAST_LEFT = 337.75
    Else
        If LAST_DES <> 2 Then
            SUM_TOP = SUM_TOP + 148.25
            SUM_LEFT = 1.5
            LAST_LEFT = 1.5
        Else
            SUM_LEFT = 337.75
            LAST_LEFT = 337.75
        End If
    End If
    If SPACE_CT = 6 Or SPACE_CT = 12 Or SPACE_CT = 18 Or _
      SPACE_CT = 24 Or SPACE_CT = 30 Then
        SUM_TOP = SUM_TOP + 2
    End If
    LAST_DES = 1
    Else
    If LAST_DES = 1 And LAST_LEFT = 337.75 Then
        SUM_TOP = SUM_TOP + 148.25
        SUM_LEFT = 1.5
        SPACE_CT = SPACE_CT + 1
    End If
    ActiveSheet.Shapes(SMY_CHART).ScaleWidth 2.335, msoFalse, _
      msoScaleFromTopLeft
    ActiveSheet.Shapes(SMY_CHART).IncrementLeft SUM_LEFT
    ActiveSheet.Shapes(SMY_CHART).IncrementTop SUM_TOP
    SUM_TOP = SUM_TOP + 148.25
    SUM_LEFT = 1.5
    SPACE_CT = SPACE_CT + 1
        If SPACE_CT = 6 Or SPACE_CT = 12 Or SPACE_CT = 18 Or _
          SPACE_CT = 24 Or SPACE_CT = 30 Then
```

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```
            SUM_TOP = SUM_TOP + 2
        End If
        LAST_DES = 2
    End If
    End If
    If BOX_SUM = "None" Then
        Windows(CHART_SHEET).Activate
    Else
        Windows(BOX_SUM).Activate
        Worksheets(CHART_SHEET_NAME).Select
    End If
    End If
    Loop
    C_CT = 0
    C_LEFT = -140.25
    C_TOP = -70.5
    PASSED = 2
    MAX_SCALE = 0
    With ActiveSheet.PageSetup
        .CenterHeader = BOX_NAME & "System Data for " & _
          CHART_SHEET_NAME
        .LeftMargin = Application.InchesToPoints(0.75)
        .RightMargin = Application.InchesToPoints(0.75)
        .TopMargin = Application.InchesToPoints(1)
        .HeaderMargin = Application.InchesToPoints(0.5)
        .FooterMargin = Application.InchesToPoints(0.5)
        .BottomMargin = Application.InchesToPoints(0.85)
        .Orientation = xlLandscape
        .PaperSize = xlPaperA4
        .CenterFooter = FOOTER
    End With
    If SAV_EXT <> "AVE" Then
        ActiveSheet.Cells(1, 1).Select
    End If
    Next l
End Sub
Sub select_cols()
    If SAV_EXT = "DAT" Then
        HOLD_DATE = Cells(PASSED, 2).Value
        t = PASSED
        START_POS = PASSED
        Do While HOLD_DATE = Cells(t, 2).Value
            t = t + 1
        Loop
        END_POS = t - 1
        PASSED = t
        SEL = 1
    Else
        START_POS = 2
        END_POS = DOWN_STOP
```


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```
        PASSED = DOWN_STOP
        SEL = 1
    End If
    Do While SEL <= Len(CHART_COL)
        ADD_COL = Mid(CHART_COL, SEL, 1)
    If Mid(CHART_COL, SEL + 1, 1) = "+" Then
    SEL = SEL + 2
    ADD_COL = ADD_COL & Mid(CHART_COL, SEL, 1)
    End If
        If SEL < Len(CHART_COL) Then
        ADD_TEXT = ADD_COL & "1," & ADD_COL & START_POS & ":" _
          & ADD_COL & END_POS & ","
        If ADD_COL <> "C" And SAV_EXT = "DAT" Or ADD_COL <> "B" _
          And SAV_EXT = "AVE" Then
        MAX_ADD = ADD_COL & "2:" & ADD_COL & MAX_RANGE & ","
        End If
        Else
        ADD_TEXT = ADD_COL & "1," & ADD_COL & START_POS & ":" _
          & ADD_COL & END_POS
        MAX_ADD = ADD_COL & "2:" & ADD_COL & MAX_RANGE
        End If
        SEL_TEXT = SEL_TEXT & ADD_TEXT
        MAX_TEXT = MAX_TEXT & MAX_ADD
    SEL = SEL + 1
    Loop
    Cells(1, 1).Select
    Max_Num_For_Scale
    Range(SEL_TEXT).Select
End Sub
Sub format_chart()
    ActiveChart.Axes(xlCategory).Select
    Selection.TickLabels.AutoScaleFont = False
    With Selection.TickLabels.Font
        .Name = "Arial"
        .FontStyle = "Regular"
        .Size = 8
    End With
    ActiveChart.Axes(xlValue).Select
    Selection.TickLabels.AutoScaleFont = False
    With Selection.TickLabels.Font
        .Name = "Arial"
        .FontStyle = "Regular"
        .Size = 8
    End With
    ActiveChart.Legend.Select
    Selection.AutoScaleFont = False
    With Selection.Font
        .Name = "Arial"
        .FontStyle = "Regular"
        .Size = 8
```

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```
    End With
    ActiveChart.Axes(xlCategory).AxisTitle.Select
    Selection.AutoScaleFont = False
    With Selection.Font
        .Name = "Arial"
        .FontStyle = "Bold"
        .Size = 6
    End With
    ActiveChart.Axes(xlValue).AxisTitle.Select
    Selection.AutoScaleFont = False
    With Selection.Font
        .Name = "Arial"
        .FontStyle = "Bold"
        .Size = 6
    End With
    ActiveChart.ChartTitle.Select
    Selection.AutoScaleFont = False
    With Selection.Font
        .Name = "Arial"
        .FontStyle = "Regular"
        .Size = 10
    End With
    ActiveChart.PlotArea.Select
    Selection.Interior.ColorIndex = xlNone
End Sub
Sub auto_sort()
    TEMP_FROM = Format(FROM_DATE, "mm/dd/yy")
    Selection.AutoFilter
    If TO_DATE <> "ALL" Then
    TEMP_TO = Format(TO_DATE, "mm/dd/yy")
    Selection.AutoFilter Field:=2, Criteria1:=">=" & TEMP_FROM, _
      Operator:=xlAnd, Criteria2:="<=" & TEMP_TO
    End If
    Selection.AutoFilter Field:=3, Criteria1:=">=" & FROM_TIME, _
      Operator:=xlAnd, Criteria2:="<=" & TO_TIME
    Cells(1, 1).Select
    TEMP_END = Selection.End(xlDown).Row
    TEMP_RIGHT = Selection.End(xlToRight).Column
    Range(Cells(1, 1), Cells(TEMP_END, TEMP_RIGHT)).Select
    Selection.Copy
    Worksheets.Add
    ActiveSheet.Name = "Chart Data " & AVE_FILE & MONTH_NAME
    Cells(1, 1).Select
    ActiveSheet.Paste
    Cells(1, 1).Select
    MAX_RANGE = Selection.End(xlDown).Row
    Application.CutCopyMode = False
    If BOX_SUM <> "None" Then
    Sheets("Chart Data " & AVE_FILE & MONTH_NAME).Copy _
      Before:=Workbooks(BOX_SUM).Sheets(1)
```


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```
    End If
    End Sub
Sub tidy_summary()
p = "n"
For Each z In Workbooks
If z.Name = BOX_SUM & ".xls" Then
p = "found"
End If
Next z
If p <> "found" Then
    Workbooks.Open FileName:= SAV_DIR & BOX_SUM & ".xls"
End If
Windows(BOX_SUM).Activate
Application.DisplayAlerts = False
For Each z In Sheets
If z.Name <> "Sheet1" And Mid(z.Name, 1, 3) <> "AVE" Then
    z.Delete
End If
Next z
Application.DisplayAlerts = True
End Sub
Sub Max_Num_For_Scale()
    Dim myRange As Range
    If SAV_EXT = "DAT" Then
    Set myRange = Worksheets("Chart Data " & AVE_FILE & _
      MONTH_NAME).Range(MAX_TEXT)
    Else
    Set myRange = Worksheets(AVE_FILE & MONTH_NAME & _
      "A").Range(MAX_TEXT)
    End If
    answer = Application.Max(myRange)
    If ROUND_UP < 0 Then
        MAX_SCALE = Application.RoundUp(answer, ROUND_UP)
        If MAX_SCALE = 0 Then
            MAX_SCALE = 1
        End If
    Else
        MAX_SCALE = ROUND_UP
    End If
    MAX_TEXT = ""
End Sub
Sub hide_sheets()
For Each z In Sheets
If Mid(z.Name, 1, 5) = "Chart" Or Mid(z.Name, 1, 3) = _
  Mid(AVE_FILE, 1, 3) Then
    z.Select
    ActiveWindow.SelectedSheets.Visible = False
End If
Next z
End Sub
```

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```
Sub tester()
Worksheets("Data").Cells(1, 8).Value = Format(Now(), "mmm")
End Sub
Sub include()
For Each sh In ActiveWorkbook.Worksheets
    If sh.Visible Then
        sh.Select
        ActiveSheet.Cells(1, 1).Select
    End If
    Next sh
End Sub
Sub default_report_setup()
Application.ScreenUpdating = False
Application.DisplayAlerts = False
NAME1 = InputBox("Enter full name of RS6000 ", "Full Name")
If NAME1 = "" Then
    End
End If
DIR1 = InputBox("Enter data dir (e.g. c:\data\boxname\) ", _
  "Data Directory ")
If DIR1 = "" Then
    End
End If
VAR1 = InputBox("Enter the variable MACHINE_ID from the " + _
  "control_load script ", "MACHINE_ID variable")
If VAR1 = "" Then
    End
End If
    temp = Worksheets("Data").Cells(1, 7).Value
    Workbooks.Add
    ActiveWorkbook.SaveAs FileName:=temp & NAME1 & " summary", _
      FileFormat:=xlNormal, Password:="", WriteResPassword:="", _
      ReadOnlyRecommended:=False, CreateBackup:=False
    ActiveWorkbook.Close
    Workbooks.Add
    ActiveWorkbook.SaveAs FileName:=temp & NAME1 & _
      " monthly summary", FileFormat:=xlNormal, Password:="", _
      WriteResPassword:="", ReadOnlyRecommended:=False, _
      CreateBackup:=False
    ActiveWorkbook.Close
    Worksheets("Control").Select
    Cells(1, 1).Select
    LINE = Selection.End(xlDown).Row
    Rows(LINE & ":" & LINE).Select
    Selection.Insert Shift:=xlDown
    Cells(LINE, 1).Select
    Cells(LINE, 1).Value = NAME1
    Cells(LINE, 2).Value = DIR1
    Cells(LINE, 3).Value = NAME1
    Cells(LINE, 4).Value = NAME1 & " summary"
```


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```
Cells(LINE, 5).Value = "1"
Cells(LINE, 6).Value = "1"
Cells(LINE, 7).Value = "00:00"
Cells(LINE, 8).Value = "23:59"
Cells(LINE, 9).Value = ".TXT"
Cells(LINE, 10).Value = "DAT"
temp = "Y"
            For Each sh In ActiveWorkbook.Worksheets
                Application.DisplayAlerts = False
                If sh.Name = NAME1 Then
                    temp = "N"
                End If
            Next sh
If temp = "Y" And NAME1 <> "" Then
    Sheets("sheet5").Select
    Sheets("sheet5").Copy Before:=Sheets(5)
    ActiveSheet.Name = NAME1
    ActiveWorkbook.Names("Auto_Open").Delete
Else
    MsgBox "Problem Sheet already exists"
End If
Rows("2:2").Select
Selection.Insert Shift:=xlDown
Rows("2:2").Select
With Selection
    .VerticalAlignment = xlBottom
    .WrapText = True
    .Orientation = 0
    .ShrinkToFit = False
    .MergeCells = False
End With
Cells(1, 1).Select
Cells(2, 1).Value = VAR1 & "U"
Cells(2, 2).Value = 3
Cells(2, 5).Value = "CPU Statistics"
Cells(2, 6).Value = "CDEFG"
Cells(2, 15).Value = "CDE"
Cells(2, 24).Value = "CF"
set_c_up
NAME2 = NAME1 & " indy"
Worksheets("Control ME").Select
Cells(1, 1).Select
LINE = Selection.End(xlDown).Row
Rows(LINE & ":" & LINE).Select
Selection.Insert Shift:=xlDown
Cells(LINE, 1).Select
Cells(LINE, 1).Value = NAME2
Cells(LINE, 2).Value = DIR1
Cells(LINE, 3).Value = NAME1
Cells(LINE, 4).Value = "None"
```

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```
Cells(LINE, 5).Value = "6"
Cells(LINE, 6).Value = "ALL"
Cells(LINE, 7).Value = "00:00"
Cells(LINE, 8).Value = "23:59"
Cells(LINE, 9).Value = ".TXT"
Cells(LINE, 10).Value = "DAT"
temp = "Y"
            For Each sh In ActiveWorkbook.Worksheets
                Application.DisplayAlerts = False
                If sh.Name = NAME2 Then
                    temp = "N"
                End If
            Next sh
If temp = "Y" And NAME2 <> "" Then
    Sheets("sheet5").Select
    Sheets("sheet5").Copy Before:=Sheets(5)
    ActiveSheet.Name = NAME2
    ActiveWorkbook.Names("Auto_Open").Delete
Else
    MsgBox "Problem Sheet already exists"
End If
Rows("2:2").Select
Selection.Insert Shift:=xlDown
Rows("2:2").Select
With Selection
    .VerticalAlignment = xlBottom
    .WrapText = True
    .Orientation = 0
    .ShrinkToFit = False
    .MergeCells = False
End With
Cells(1, 1).Select
Cells(2, 1).Value = VAR1 & "U"
Cells(2, 2).Value = 3
Cells(2, 5).Value = "CPU Statistics"
Cells(2, 6).Value = "CDEFG"
Cells(2, 15).Value = "CDE"
Cells(2, 24).Value = "CF"
set_c_up
NAME2 = NAME1 & " ave"
Worksheets("Control ME").Select
Cells(1, 1).Select
LINE = Selection.End(xlDown).Row
Rows(LINE & ":" & LINE).Select
Selection.Insert Shift:=xlDown
Cells(LINE, 1).Select
Cells(LINE, 1).Value = NAME2
Cells(LINE, 2).Value = DIR1
Cells(LINE, 3).Value = NAME1
Cells(LINE, 4).Value = NAME1 & " monthly summary"
```


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```
    Cells(LINE, 5).Value = "6"
    Cells(LINE, 6).Value = "6"
    Cells(LINE, 7).Value = "00:00"
    Cells(LINE, 8).Value = "23:59"
    Cells(LINE, 9).Value = "A.TXT"
    Cells(LINE, 10).Value = "AVE"
    temp = "Y"
                For Each sh In ActiveWorkbook.Worksheets
                    Application.DisplayAlerts = False
                    If sh.Name = NAME2 Then
                        temp = "N"
                    End If
                Next sh
    If temp = "Y" And NAME2 <> "" Then
        Sheets("sheet5").Select
        Sheets("sheet5").Copy Before:=Sheets(5)
        ActiveSheet.Name = NAME2
        ActiveWorkbook.Names("Auto_Open").Delete
    Else
        MsgBox "Problem Sheet already exists"
    End If
    Rows("2:2").Select
    Selection.Insert Shift:=xlDown
    Rows("2:2").Select
    With Selection
        .VerticalAlignment = xlBottom
        .WrapText = True
        .Orientation = 0
        .ShrinkToFit = False
        .MergeCells = False
    End With
    Cells(1, 1).Select
    Cells(2, 1).Value = VAR1 & "U"
    Cells(2, 2).Value = 3
    Cells(2, 5).Value = "CPU Statistics"
    Cells(2, 6).Value = "BCDEF"
    Cells(2, 15).Value = "BCD"
    Cells(2, 24).Value = "BE"
    set_c_up
    Worksheets("Control").Select
    Application.ScreenUpdating = True
    ActiveWorkbook.Save
    MsgBox "Default Reports Setup Complete"
End Sub
Sub set_c_up()
    Cells(2, 7).Value = "Date/Time"
    Cells(2, 8).Value = "%"
    Cells(2, 9).Value = "xlColumnStacked100"
    Cells(2, 10).Value = "2"
    Cells(2, 11).Value = "Default Report ((c)1998 Robert Russell)"
```

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```
    Cells(2, 12).Value = "N"
    Cells(2, 14).Value = "User + System CPU Stats"
    Cells(2, 16).Value = "Date/Time"
    Cells(2, 17).Value = "%"
    Cells(2, 18).Value = "xlLineStacked"
    Cells(2, 19).Value = "1"
    Cells(2, 20).Value = "Default Report ((c) 1998 Robert Russell)" _
      & Chr(13) & "Report shows TOTAL of %usr+%sys"
    Cells(2, 21).Value = "Y"
    Cells(2, 22).Value = "100"
    Cells(2, 23).Value = "%WIO CPU Stats"
    Cells(2, 25).Value = "Date/Time"
    Cells(2, 26).Value = "%"
    Cells(2, 27).Value = "xlLineMarkers"
    Cells(2, 28).Value = "1"
    Cells(2, 29).Value = "Default Report ((c) 1998 Robert Russell)"
    Cells(2, 30).Value = "Y"
    Cells(2, 31).Value = "100"
    End Sub
Sub page_setup_margins()
    For Each p In ActiveWorkbook.Sheets
        p.PageSetup.BottomMargin = Application.InchesToPoints(1.18)
        p.PageSetup.BlackAndWhite = False
    Next p
End Sub
```

This article concludes in next month's issue of AIX Update.

Robert Russell (UK) © Xephon 1998

Disk usage in megabytes

The **du** command is used to display how much disk space is used in directories and subdirectories. The output of this command displays disk usage in blocks.

The short script in this article, **mb** (for megabytes), displays disk usage in megabytes as well as blocks. I hope it proves useful in its own right (the technique used in its implementation may also prove useful).

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MB

```
#!/bin/ksh
#
#   mb
#
#   Display contents of subdirectories as blocks and megabytes
#
#   Author:            John Rainford, 1998
#
BLOCKSIZE=512           # For AIX

DO_main ()
{
        du $* | \
        awk '{printf "%8d blocks, %8.3f Mb  %s\n", \
                $1, $1 * '$BLOCKSIZE' / (1024 * 1024), $2}'
}

DO_main $*
```

Output of typical **du** command:

```
$ du

12      ./classes/ok
4       ./classes/try
74      ./classes
756     .
```

Output of **mb** script:

```
$ mb
      12 blocks,    0.006 Mb  ./classes/ok
       4 blocks,    0.002 Mb  ./classes/try
      74 blocks,    0.036 Mb  ./classes
     652 blocks,    0.318 Mb  ./guide
     756 blocks,    0.369 Mb  .
```

Note that the script allows for parameter such as **-s** (summary). For more details of the **du** command, consult the relevant **man** pages; many of **du**'s options are applicable to **mb** – for example:

```
$ mb -s

     756 blocks,    0.369 Mb  .
```

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A function to change passwords on AIX

The ready-to-compile function *ChangePassword()* is useful when you need to change the password for any userid without answering the questions provided by **chpwd** shell command. The process that uses the *ValidUser()* function must be running with *root* permissions. It also works fine if you use a NIS server.

CHANGEPASSWORD()

```
/*
** chpasswd.h
**
** Password changement function
**
*/

#define CHANGE_OK   0
#define CHANGE_KO   1

int ChangePassword(char *szUserid, char *szClearOldPass, char
*szClearNewPass);

/*
** chpasswd.c
**
** Password change routine
**
*/

/*
 *---------------------------------------------------------------------
 * include section
 *---------------------------------------------------------------------
 */
#include <stdlib.h>
#include <stddef.h>
#include <errno.h>

#include "chpasswd.h"

/*
 *---------------------------------------------------------------------
 * ChangePassword - Perform password change
 *
```


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```
 * Arguments
 *     szUserid          - Userid
 *     szClearOldPass    - Old password (not encrypted)
 *     szClearNewPass    - New password (not encrypted)
 *
 * Return
 *     CHANGE_OK  if change was performed correctly
 *     CHANGE_KO  if change was performed incorrectly
 *-------------------------------------------------------------------
 */
int
ChangePassword ( char *szUserid,
                 char *szClearOldPass,
                 char *szClearNewPass )
{
    int  i;
    int  nReenter;
    char *sMsg;
    char szResponse[20];

    /*
    ** chpass routine call
    */
    for ( i=0; i<4; i++ )
    {
        switch ( i )
        {
        case 0:
        case 1:
            strcpy(szResponse,szClearOldPass);
            break;
        case 2:
        case 3:
            strcpy(szResponse,szClearNewPass);
            break;
        }

        if ( chpass(szUserid,szResponse,&nReenter,&sMsg) )
                    return(CHANGE_KO);
    }

    return (CHANGE_OK);
}
```

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New C and C++ compilers from IBM

One of the main reasons for the widespread adoption of the Unix operating system by the computing industry is its superiority as a development platform. The availability of common development tools, such as **make**, **sccs**, **awk**, **sed**, and **m4**, combined with Unix's flat (non-segmented) memory model and the power of RISC processors, has given rise to a powerful development environment. In addition to this, X-Windows and Motif provide support for advanced GUI development and deployment. These days Unix systems are used mostly as servers, with Wintel-based PCs taking the role of development workstations. Nevertheless, there are some developments that are still carried out on Unix systems, which means that appropriate software tools are still being released for this platform.

In this article I am going to describe the new C and C++ compilers released by IBM for RS/6000 machines operating under version 4.3 of the AIX operating system. I'll also describe features of another development tool, VisualAge for C++ Professional for AIX , which is to be announced by IBM in the near future.

C FOR AIX 4.3

The C for AIX 4.3 compiler is a straight replacement for C for AIX 4.1. This compiler is installed in the */usr/vac* subdirectory and is supported under all releases of AIX 4. Both it and the product it replaces can be installed concurrently on your system, which may assist developers to port applications to the new environment.

In order to use the compiler, the developer should add the directory */usr/vac/bin* to the path variable of its default shell or use the full path name of the compiler driver, for instance, */usr/vac/bin/xlc*. Another possibility is to run the */usr/vac/bin/replaceCSET* script, which replaces links to compiler driver commands in */usr/bin* with ones to */usr/vac/bin*, thus migrating from older versions of the compiler.

The compiler's documentation is supplied in HTML format and can be viewed using Netscape by loading the following location: *file:/usr/vac/html/en_US/index.htm*.

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The most important innovation of this product is support for the generation of 64-bit programs. Both 32-bit and 64-bit programs can be generated by the compiler, the default being 32-bit code. In order to generate 64-bit programs, the developer must invoke the compiler using the **-q64** option. The **-qwarn64** option causes the compiler to issue warnings about code that might be problematic in a 64-bit environment. In addition, the **lint** command (with the **-t** option) has been extended to perform checks for similar problems. In my opinion, the most thorough checks are performed when the compiler is invoked with both the **-q64** and **-qwarn64** options.

Other notable additions are in the area of heap memory allocation. For a start, you can now utilize multiple heap memory pools. The main reason to use this technique is to improve program performance. This is achieved by reducing the contention involved with access to the single common heap provided by the run-time environment as a default. The gain is especially significant for programs that contain multiple threads. The programmer may also dedicate heaps for specific data structures, thereby reducing memory fragmentation and paging caused by sharing a single default memory heap among a number of data structures. Additionally, it's now possible to deallocate the whole heap in one operation, without performing the time-consuming process of scanning data-structures. Another important new feature of the compiler's memory management system is the use of the 'debug version' of system calls involved in memory management. The compiler option **-qheapdebug** automatically maps all memory management system calls to their debug version. The names of the debug functions are prefixed by *_debug_* (for example, *_debug_malloc*), and they are defined in <*malloc.h*> and <*stdlib.h*>. The names of heap-specific functions are prefixed with *_debug_u* (for example, *_debug_umalloc*), and are defined in <*umalloc.h*>.

The following table summarizes the debugging functions available for both standard and user-defined heaps.

Default heap debug functions	User-defined heap debug functions
_debug_calloc	_debug_ucalloc
_debug_malloc	_debug_umalloc
_debug_free	No heap-specific version
_debug_realloc	No heap-specific version

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```
_dump_allocated              _udump_allocated
_dump_allocated_delta        _udump_allocated_delta
_heap_check                  _uheap_check
_debug_heapmin               _debug_uheapmin
```

The last four functions are non-standard and do the following tasks:

- *_dump_allocated*
  Print information to *stderr* about each memory block currently allocated by regular or debug functions. This function should be called explicitly by the programmer.
- *_dump_allocated_delta*
  Print information to *stderr* about each memory block allocated by regular or debug functions since the last call to *_dump_allocated* or *_dump_allocated_delta*. This function should also be called explicitly by the programmer.
- *_heap_check*
  Checks all memory blocks allocated or freed in order to verify that the bounds of allocated or freed blocks have not been overwritten. All errors found are reported to *stderr*. This function is called automatically by all the debug functions, and it may also be called explicitly at any point in a program.
- *_debug_heapmin*
  Debug version of system call that releases all unused memory from the default or user-defined heap.

Additional debug versions exist for the following memory and string manipulation functions from the standard C library:

```
Function Name                Effect
_debug_memcpy                Copy bytes
_debug_memmove               Copy bytes
_debug_memset                Set bytes to value
_debug_strcat                Concatenate strings
_debug_strcpy                Copy strings
_debug_setncat               Concatenate strings
_debug_strncpy               Copy strings
_debug_strnset               Set characters in strings
_debug_strset                Set characters in strings
```

This release of C for AIX uses the License Management System instead of iFOR/LS for licence management. The file */usr/vac/README.license* contains instructions for licence set up.

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IBM C and C++ Compilers for AIX Version 3.6 (one product) replaces CSet++ 3.1.4 for AIX 4. This compiler is installed in the */usr/ibmcxx* subdirectory and is supported under all releases of AIX 4. It should be noted that the replaced product (CSet++) is unsupported under AIX 4.3.

Some incompatibilities have been reported between the run-time support of C++ Version 3.6 and programs compiled by CSet++ under versions prior to AIX 4.3. These issues were fixed by PTFs combined into Release 3.6.4 of the C and C++ Compilers product. The fixes also provide support for the creation of 64-bit C++ programs.

To use the compiler, developers should use one of three options: use the full path name of the compiler driver, edit its path variable, or run the */usr/ibmcxx/bin/replaceCSET* script.

The compiler's HTML documentation is installed in */usr/ibmcxx/html/en_US/index.htm*.

This product's C component is identical to the C for AIX 4.3 product. For this reason I'll spend the rest of this article discussing the C++ component. It seems that IBM's priority was to provide a 64-bit C++ compiler as quickly as possible. The product consequently lacks many of the development tools that were part of its predecessor, CSet++. Among these are the Source Code Browser, Makefile Builder, LPEX Editor, Test Coverage, and HeapView Debugger.

The integration of these tools with the CDE GUI environment has also been lost. The only tool that is supplied is the XLDB graphical source code debugger. Also bear in mind that the compiler lags severely behind current C++ draft standards.

The product is supplied with IBM Open Class libraries that contain a rich set of GUI and Collection Classes. The libraries are supplied both as object code and as source. Unfortunately, it is not possible to recreate the object code from the source files, which are supplied for reference and debugging use only.

The STL Collections Library, a must for any truly portable C++ development, is included 'as is' without any IBM support. This

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version of the STL Collections library is from Silicon Graphics, with slight modifications for compatibility with the IBM C and C++ Compilers product.

SGI has two versions of the libraries – a full version and a restricted version that does not depend on compiler default template parameters. The library included is based on the SGI restricted version.

There is a great deal of overlap in functionality between the C++ STL Collections library and the IBM Collections library. STL, being part of future C++ standard, should be the preferred solution for creating general-purpose abstract data structure classes for new applications.

The compiler, and most of the libraries supplied with it, are delivered on three separate CD-ROMs containing versions of the product for AIX, OS/2, Windows 95, and Windows NT. It is therefore possible to utilize this product for developing software that is easily ported between these operating systems.

VISUALAGE FOR C++ PROFESSIONAL FOR AIX V4.0

The long-awaited AIX version of VisualAge for C++ was recently released by IBM. Version 3.6 of VisualAge for C++ (which is for OS/2 and Windows only) provides an Integrated Development Environment with some excellent features. This preview is based on the contents of a white paper published by IBM that you can view at *http://www.software.ibm.com/ad/visualage_c++/* as I've not had a chance to examine the product in detail.

- *Integrated Development Environment*
  All development activity is performed from a tightly integrated development environment that combines a language sensitive editor and object-oriented source code browser, debugger, and compiler invocation tools.
- *Incremental compilation*
  Only the changed parts of code and parts that are directly affected by the changes are compiled in order to build an application. This significantly reduces the time taken to compile (and, therefore, develop) an application.

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- *Powerful and simple makefile replacement*
  It is possible to define configuration files that direct the compiler to files and options that should be used to build a program. This method of configuration is simple, flexible, and powerful, and much easier to maintain than 'traditional' makefiles.

- *Orderless programming*
  The compiler now allows you to eliminate the need to define functions or classes prior to their use, also eliminating the need for local *include* files. Conventional ordered source code is still supported and preferred for portable development, however.

- *Improved template handling*
  This is claimed to provide substantial improvements in speed of compilation and size of object code.

- *Rapid application development tools*
  The product includes Visual Builder and Visual Data Access Builder tools. These allow visual assembly of applications from parts supplied with the compiler. The source code generated by these tools contains no system-specific language constructs.

- *Reusable components*
  The IBM Open Class Library supplied with the product includes classes for Graphical User Interface, Collections, I/O stream, and Data Access programming.

- *On-line help*
  On-line help is based on HTML, with fast access from popular browsers, and an efficient integrated search function.

- *Standards compliance*
  VisualAge for C++ Professional supports ISO C++ language and library draft specifications dated November 1997. It conforms to following standards:

  1 *ISO/IEC 9945-1:1990/IEEE POSIX 1003.1-1990*

  2 *ANSI/ISO-IEC 9899-1990 C Standard*, with support for *Amendment 1:1994*.

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IBM has announced the RS/6000 model S70, a 64-bit enterprise server that can be configured as a four-way, eight-way, or 12-way SMP system. It supports both 32-bit and 64-bit standard PCI adapters and uses the 64-bit 262 MHz RS64 II processor with 8 MB of Level 2 cache per processor and up to 32 GB of system memory. The system comes with AIX 4.3.2 pre-installed. It's out now, but no details on prices were announced.

IBM also announced the DB2 Universal Database Version 5.2, targeted at data warehousing, data mining, and OLAP. It supports the WebSphere Application Server and has a Web Control Centre that allows the database to be managed from any browser. AIX is one of the many platforms supported, and Version 5.2 prices start at US$1000 per server and US$200 per user. A single-user desktop version is US$370.

For further information, contact your local IBM representative.

* * *

Bull has announced new products and services for its line of AIX servers. New hardware includes a new 64-bit processor for the Escala RL470 and EPC1200, which are said to double the 12-way system's performance. The company is making 10% of its R&D teams available for high-end consulting to customers, with expertise available on HA, TP, databases, ERP, Internet, security, and software release management.

The company also announced plans to ship 64-bit processors, operating systems, and databases across its range of Escala SMP servers this autumn. All current models will get the new processors, while older versions of the current range will also be eligible.

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* * *

FirstSense has announced Version 1.1 of its FirstSense Enterprise applications performance management software, which monitors ERP application performance and availability from the end user's perspective. Client platforms supported include Windows 9*x* and Windows NT, and server platforms supported are Unix and Windows NT. Out now, the base product for an unlimited number of agents and a single server is US$22,500.

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