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Accessing IBM i Health Indicators by Using Performance Data Investigator

Introduction

This IBM® Redpaper™ publication describes how to access and analyze IBM i health indicators by using the Performance Data Investigator (PDI) options that are part of the IBM Navigator for i graphical user interface (GUI). It explains how to access the PDI and how to view and modify various presentations of system performance data.

Note: Although this paper was produced with a system running IBM i 7.2, some of the features discussed here might be available in previous releases. For the best functions and most expansive selection of options, running IBM i 7.2 with the latest fixes and technology refreshes is considered a good practice.

Accessing the Performance Data Investigator

To access the PDI, you must first connect to the IBM Navigator for i instance that is running on the system that contains the performance data to be analyzed.

Complete the following steps to access the PDI:

1. Connect to your system. By default, the URL that is used to access the system is like this example, where *yoursystem* is either the system name or IP address of the system to which you are connecting:

   `http://yoursystem:2001`

   Note: This paper is based on the assumption that your IBM Navigator for i connection is working appropriately. It does not cover troubleshooting steps to resolve access issues. For assistance with accessing IBM Navigator for i, contact IBM Software Support at 800.IBM.SERV or open a support request online:

   `http://www.ibm.com/support`

2. In the sign-on screen, shown in Figure 1, enter a user ID and password that have sufficient authority to access the web services and the performance data repositories, and then click **Log in**.

Figure 1 IBM Navigator for i login screen

The navigation panel at the left of the IBM Navigator for i Welcome screen (Figure 2) shows the management options that are available to you.

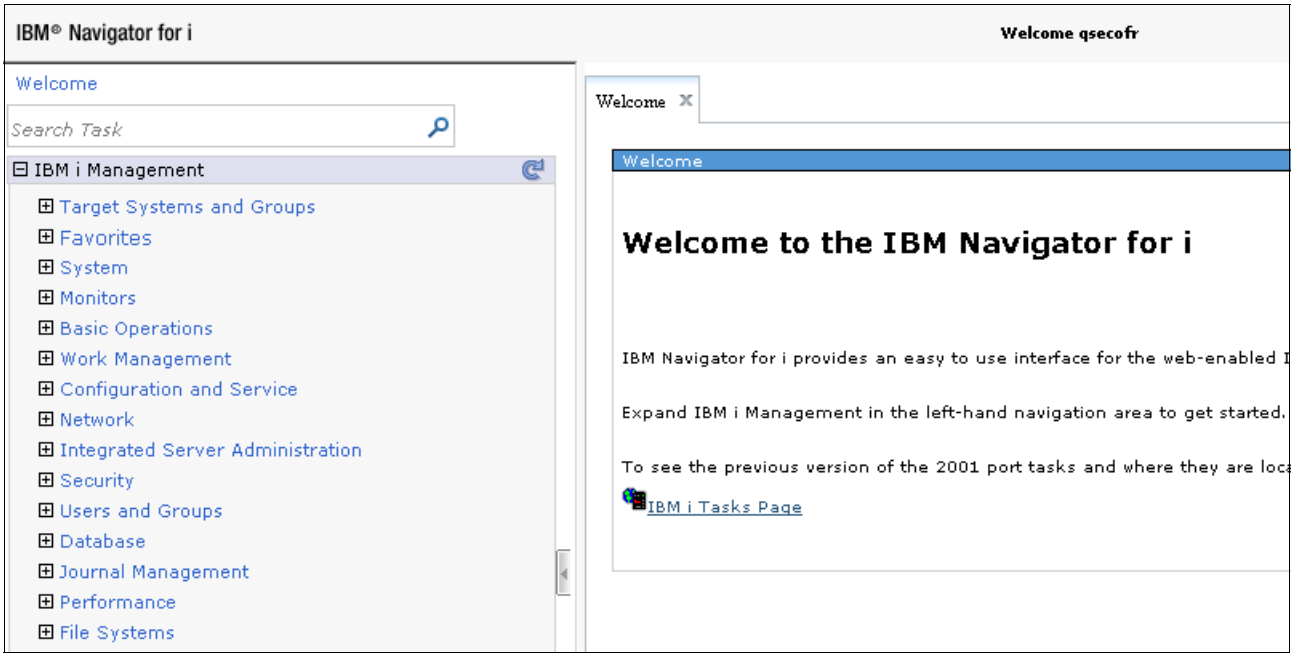

Figure 2 Welcome screen for IBM Navigator for i

3. To access the PDI, click **IBM i Management** → **Performance** → **Investigate Data**, as shown in Figure 3.

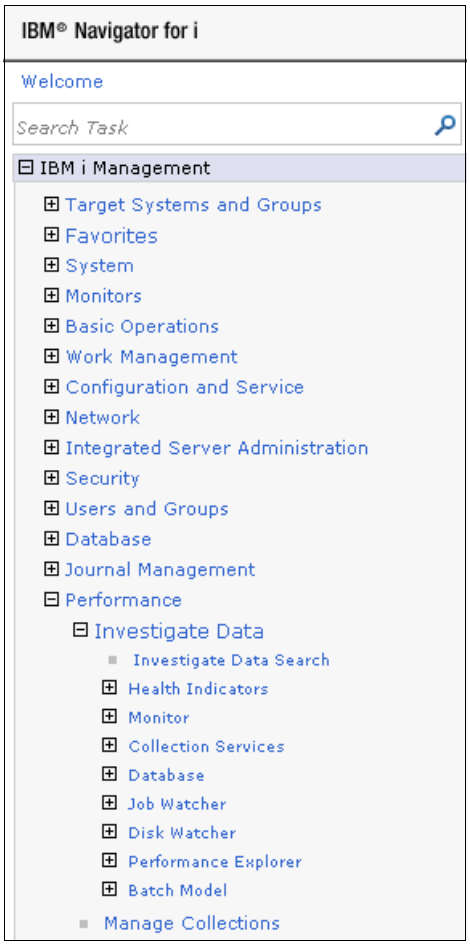

Figure 3 Navigation path to access the Performance Data Investigator

You are now in the Performance Data Investigator.

Viewing health indicators

By default, various health indicators are included in the PDI section of IBM Navigator for i installation. These include threshold values that are set by IBM to generally accepted levels for normal system operations. If you want to modify these threshold values, that is easy to do and is explained in “Modifying health indicator threshold values” on page 11.

Note: Database health indicators were added to the available options in IBM i 7.2.

Complete the following steps to view the IBM i health indicators by using the PDI:

1. After opening the PDI in Navigator for i, expand the section for **Health Indicators** and click **System Resources Health Indicators**, as shown in Figure 4.

Figure 4 Health indicators within the PDI

2. The System Resources Health Indicators tab of the Navigator for i screen is populated with choices for you to make, as shown in Figure 5. In the Collection section, click the drop-down menu for **Collection Name**.

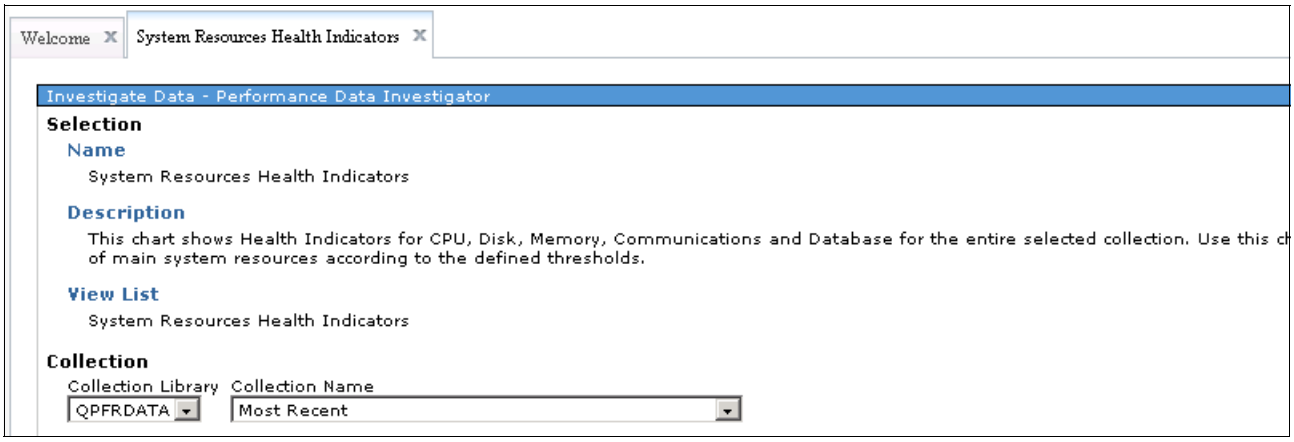

Figure 5 System Resources Health Indicators

3. As Figure 6 shows, you can select data from various dates to view. In this example, the Most Recent collection is selected, which is the default.

   Click **Display.**

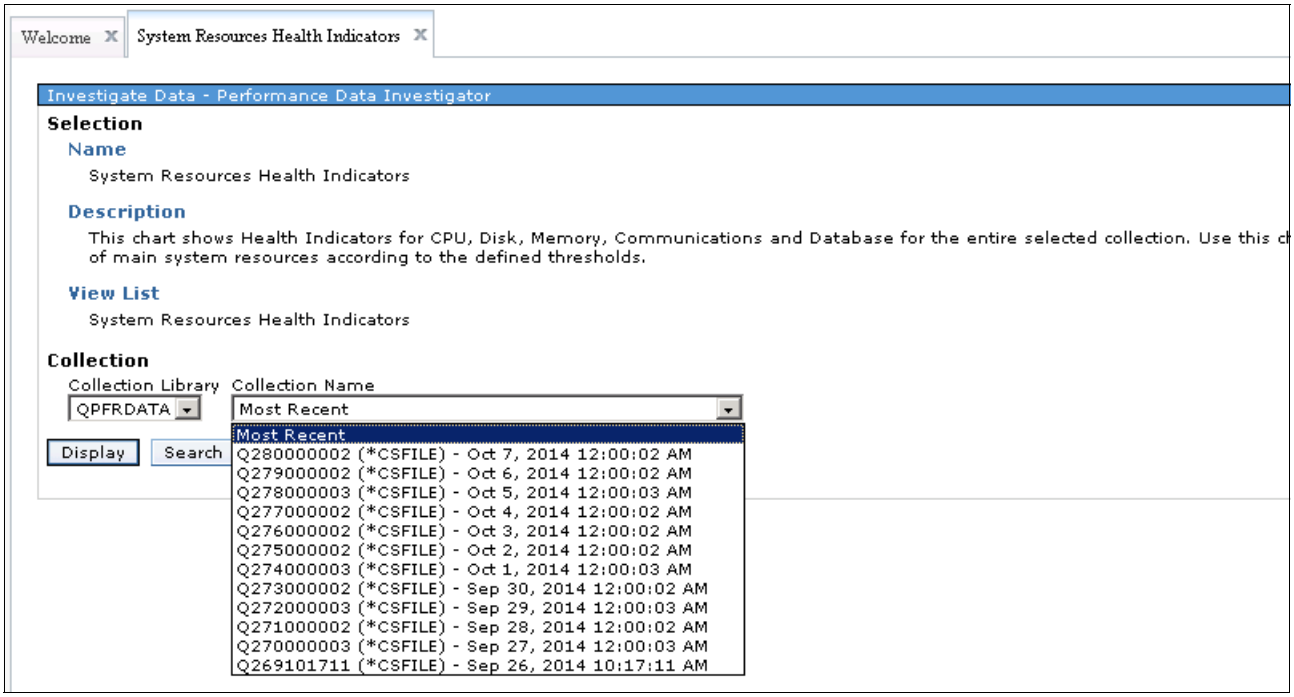

Figure 6 Selecting a collection

4. A window similar to the one shown in Figure 7 displays various indicators of system health and produces a bar graph of those indicators. It shows the percentage of time that monitored situations were under thresholds, when values exceeded one threshold but not a second one, and when values exceeded both thresholds.

   Each section can contain more than one performance metric. For example, the CPU section contains three values that are monitored: Interactive CPU Utilization, Jobs CPU Queueing Percent, and Partition CPU Utilization. All of these values must be below the monitored thresholds for the health indicator to be green (optimal).

   Note: Health indicators often contain more than one measured metric. Each metric contributes to the overall view of the health indicator.

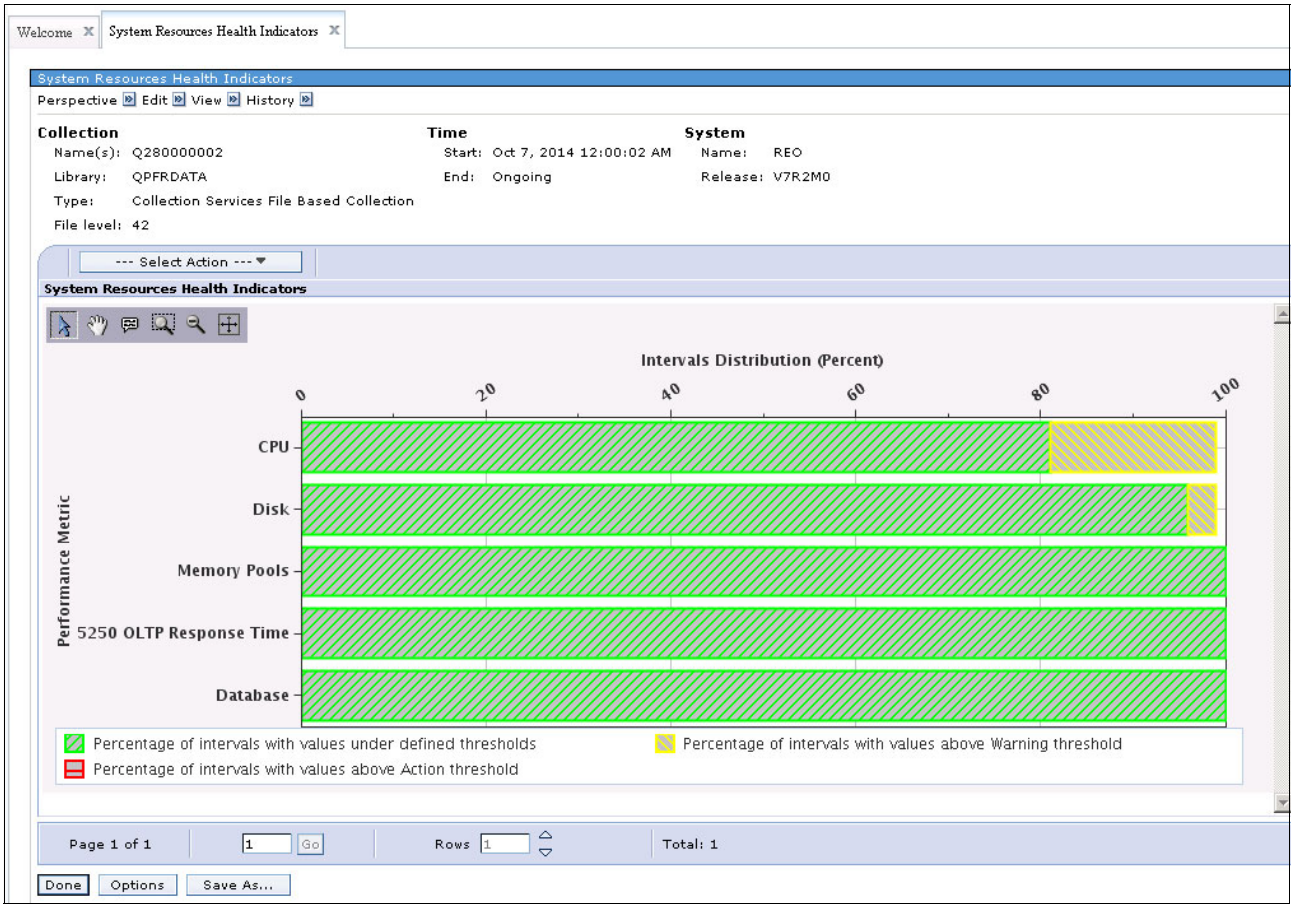

Figure 7 Results of the System Resources Health Indicators investigation

5. To determine what is causing thresholds to be reached, use the **Select Action** drop-down menu shown in Figure 8 to choose the section that is in question. For this example, we selected **CPU Health Indicators**, because a threshold is breached approximately 20% of the time, as shown in Figure 7 on page 6, previously.

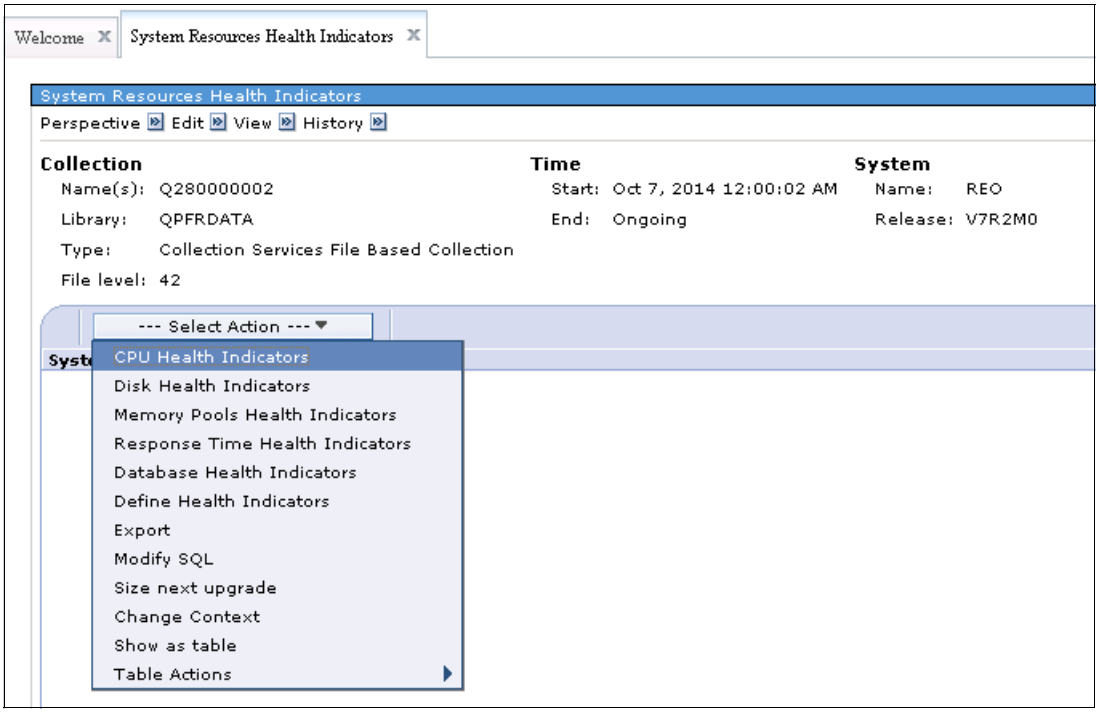

Figure 8 Drilling down to see the individual metrics that comprise the CPU health indicators

The detailed data display shows each section of what makes up the CPU health indicator. Based on the data shown in Figure 9, it appears that the Partition CPU Utilization is the largest risk to the health of the system.

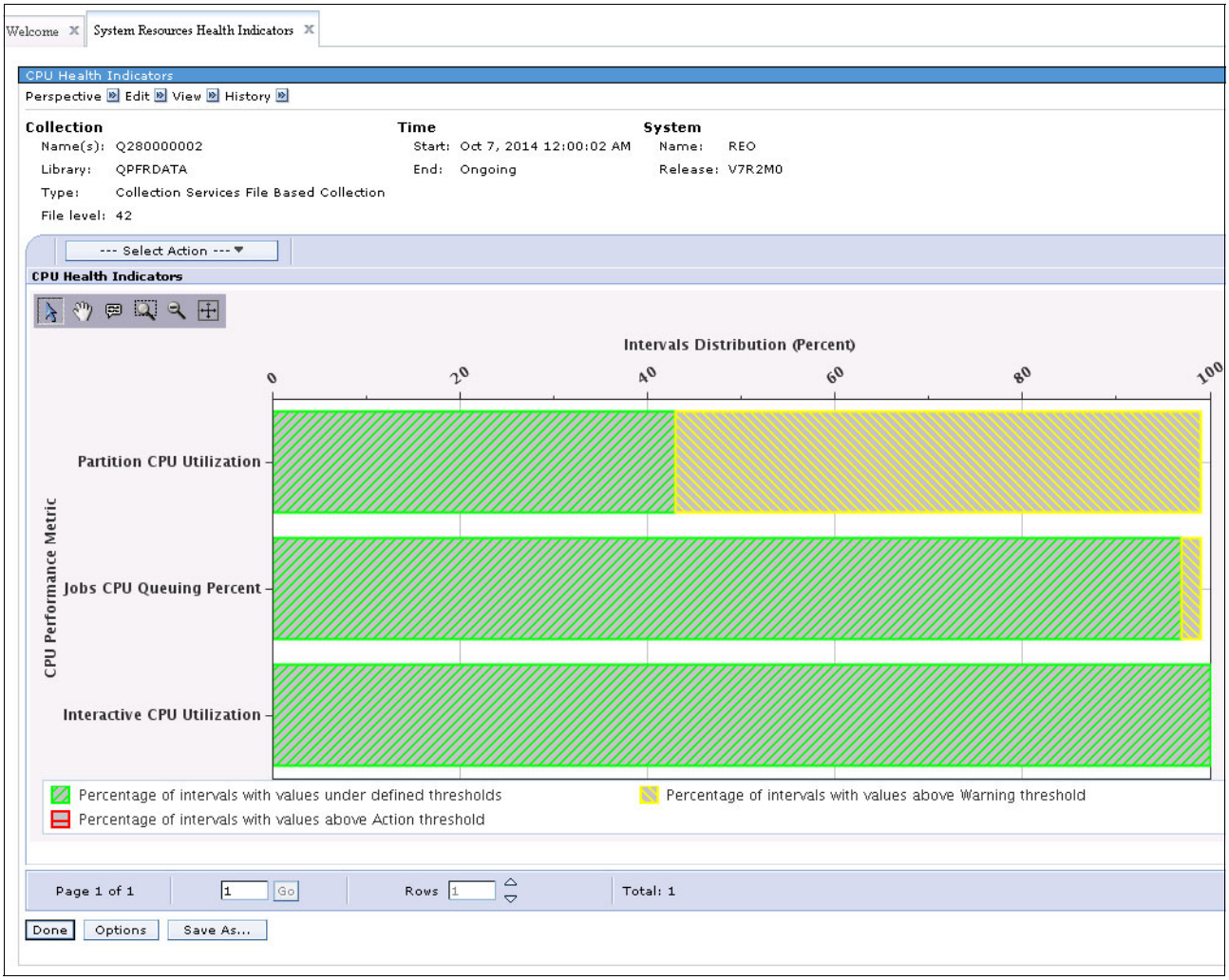

Figure 9 CPU health indicator metrics

6. For details about what is causing this value to exceed thresholds, use the Select Action drop-down menu again. This view is a layer deeper within the PDI, so new options are available as, shown in Figure 10.

   Click **CPU Utilization Overview**.

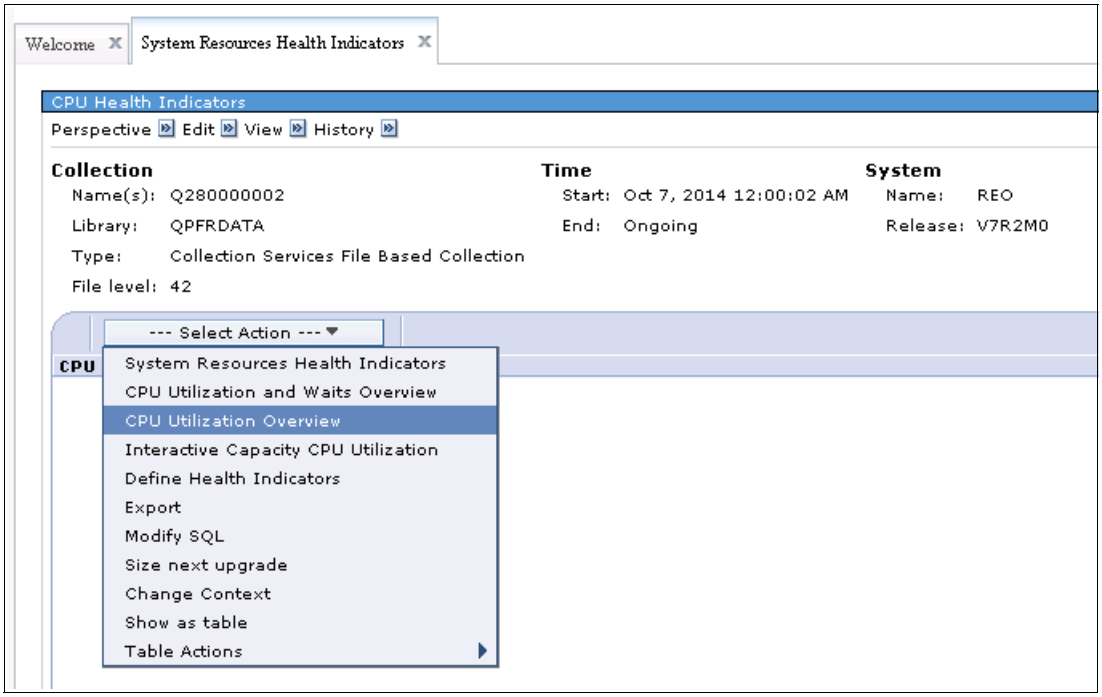

Figure 10 Options available to look deeper into system performance

New charts are shown next. The section for CPU Utilization is shown in Figure 11.

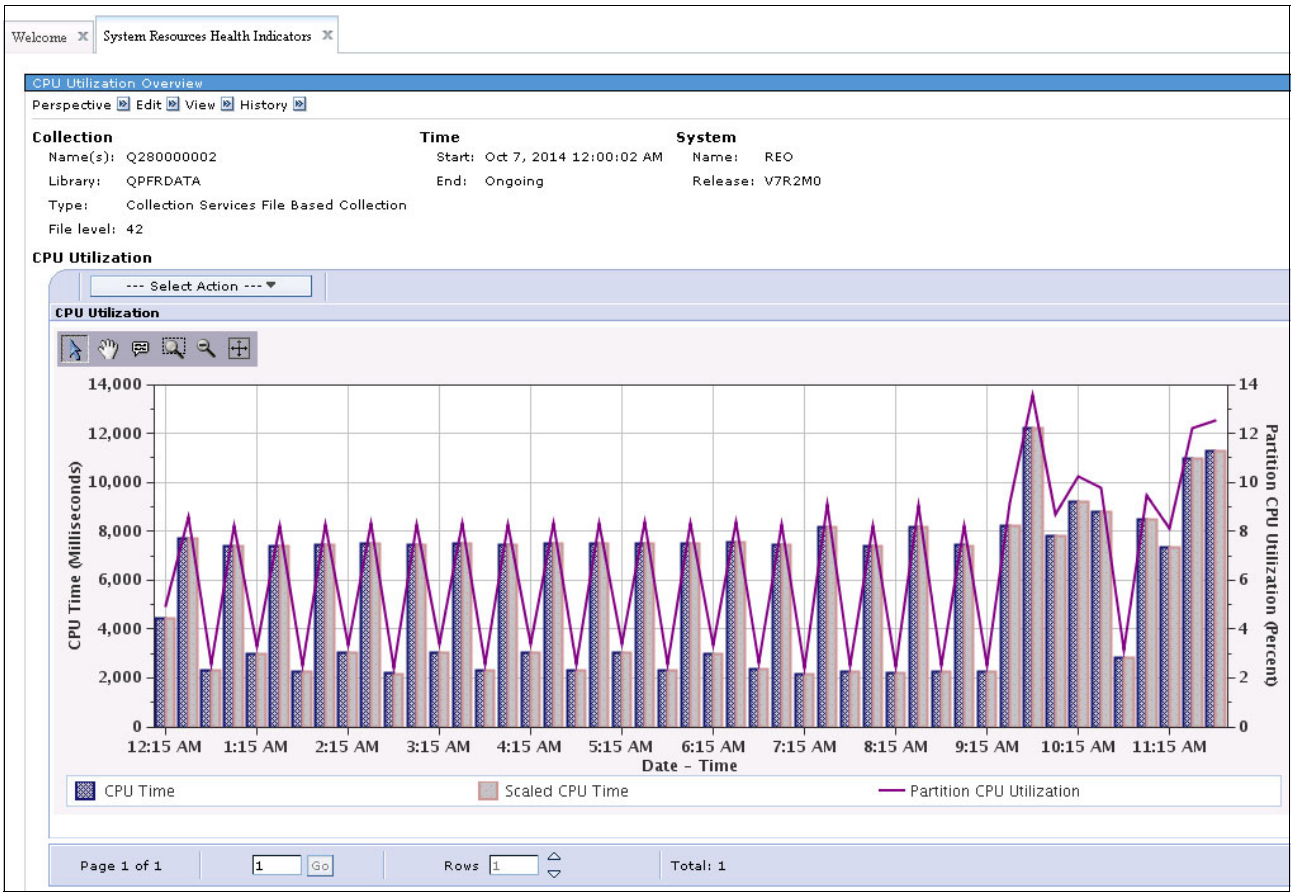

Figure 11 Portion of the CPU Utilization charts that are available in the PDI

7. From the data presented in the CPU Utilization chart, you can see more details by selecting an option from the **Select Action** drop-down menu, as shown in Figure 12.

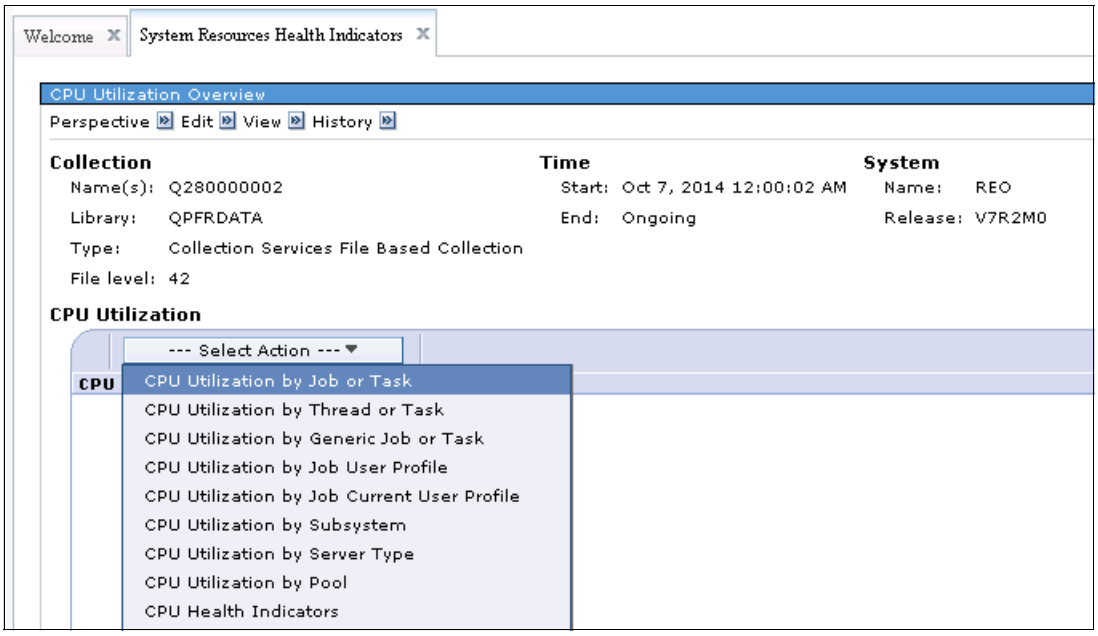

Figure 12 Additional CPU analysis options

Modifying health indicator threshold values

Depending on your system, it might be necessary to modify the threshold values from which the health indicators charts are created.

Complete the following steps to modify a health indicator threshold value:

1. From a PDI window where health indicator charts are active, use the Select Action drop-down menu, and select **Define Health Indicators**, as shown in Figure 13.

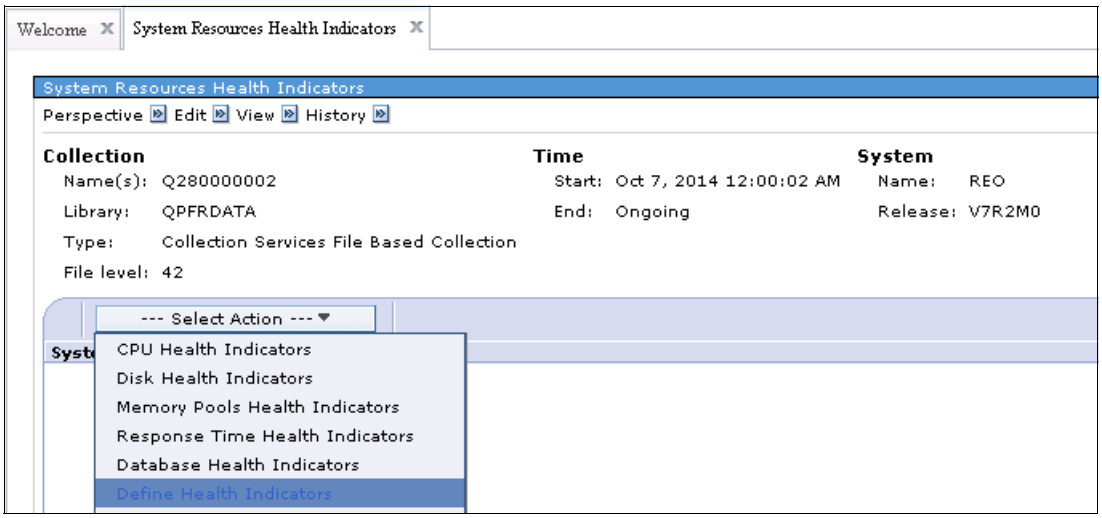

Figure 13 Define Health Indicators option selected for values used to generate health indicator charts

2. The next panel presented looks similar to the one in Figure 14, where you can select from options to modify your charts.

   In the first section, System Resources Health Indicators, you can choose which items appear in the chart. Select the specific health indicator and click **Add** or **Remove**.

   These remaining sections contain thresholds that can be modified: CPU, Disk, Memory Pools, 5250 OLTP Response Time, and Database.

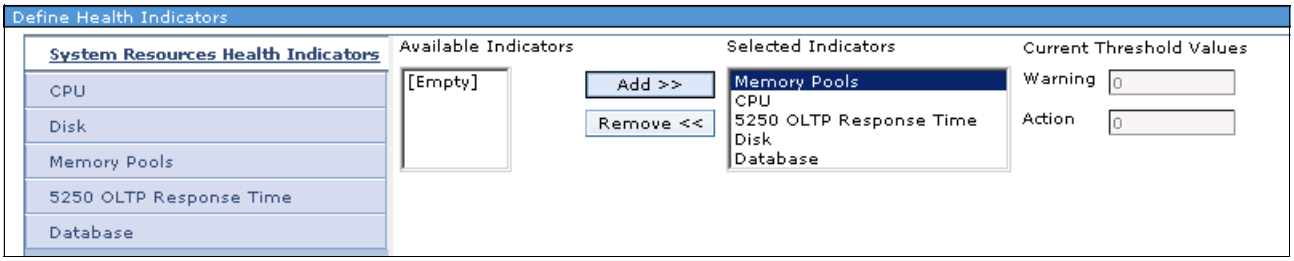

Figure 14 Options available for modification of default settings

3. In this example, we modify the CPU thresholds to unattainable values to make the charts look significantly different than before.

   To modify the CPU thresholds, click **CPU** from the list at the left section of the screen. The following three CPU metrics are available, as shown in Figure 15:

   – Interactive CPU Utilization
   – Jobs CPU Queuing Percent
   – Partition CPU Utilization

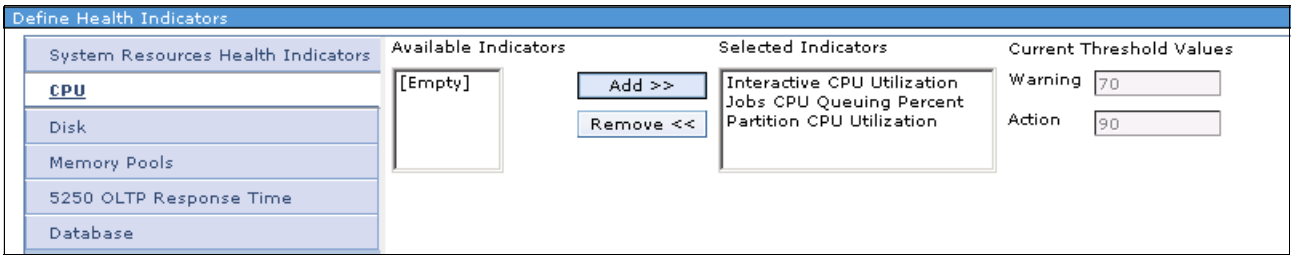

Figure 15 Options available for modifying the CPU health indicator parameters

4. Select the **Partition CPU Utilization** health indicator to see the current threshold values, as shown in Figure 16. To test how this works, modify the values to ridiculous numbers, such as a 2% for warning and 5% for action, and click **OK**.

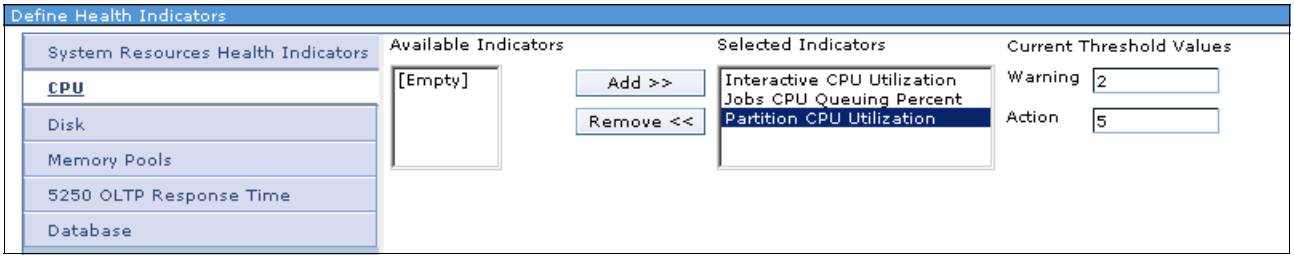

Figure 16 Modifying the Partition CPU Utilization threshold values

The chart is recalculated, based on the new threshold values. Notice that the system health now appears much worse than before, as shown in Figure 17.

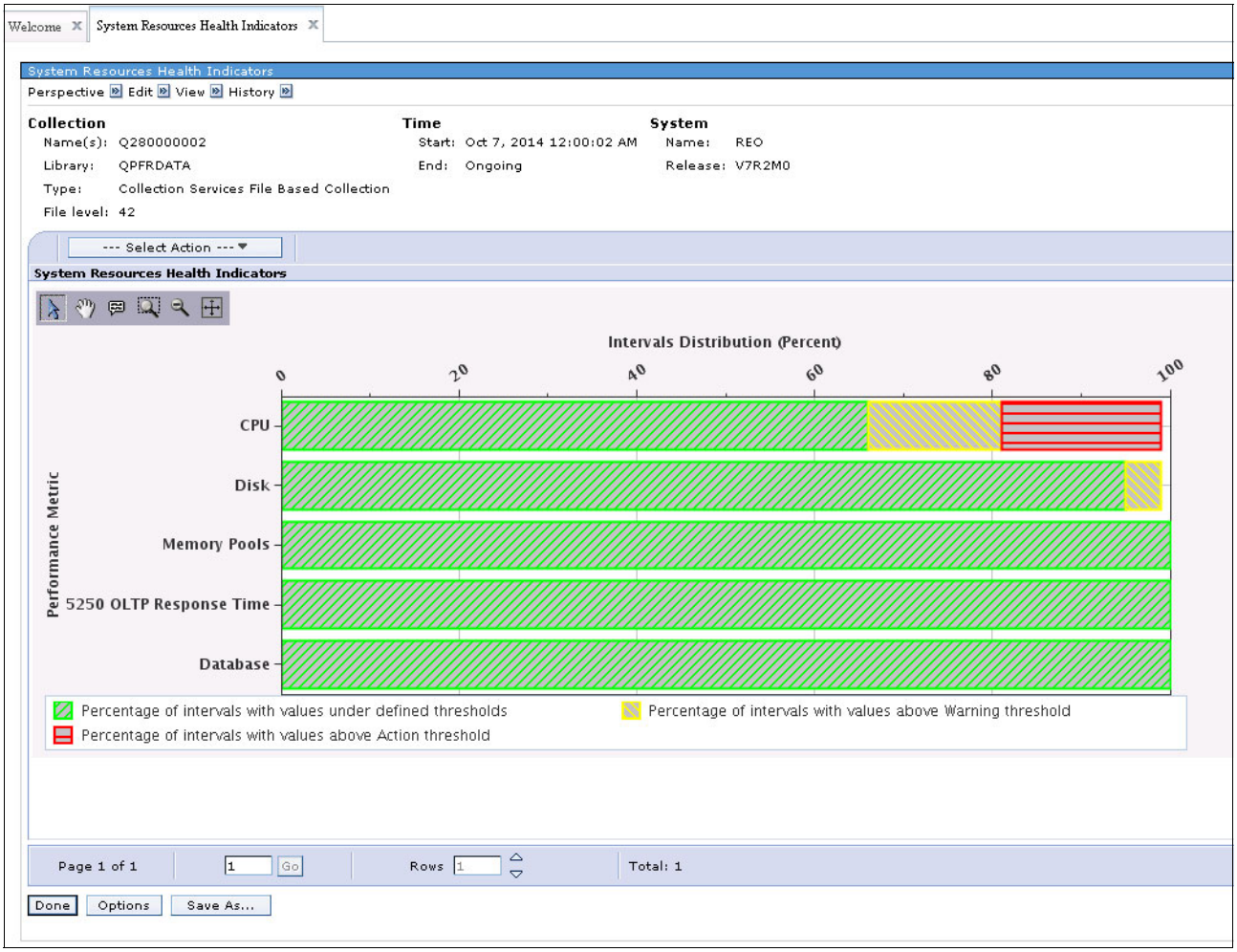

Figure 17 Chart created with CPU utilization threshold values which have been modified from the system defaults

Other views available within the PDI

This paper shows you how to use and modify the IBM i health indicators in the PDI. There are many views available to help you monitor, analyze, and resolve performance situations within the IBM i operating system.

Very granular views of many items in Collection Services data are available. Expanding the items within the navigation tree presents many views of various metrics. These are accessed in the same manner as the health indicators. Just click one, select the timeframe of the collected data, and review the display.

Figure 18 shows the expanded navigation tree for *Disk*.

Figure 18 Expanded navigation tree for disk data from within the PDI

There are numerous views available, so it can be occasionlly be difficult to find precisely what you are looking for. However, it is possible to search for what you want by keyword by clicking **Investigate Data Search**, as shown in Figure 19.

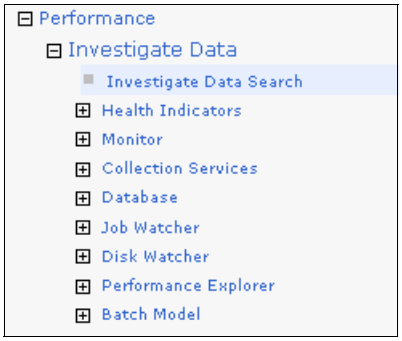

Figure 19 Searching for a particular chart

Figure 20 shows the Investigate Data Search display for keyword entry and other search parameters.

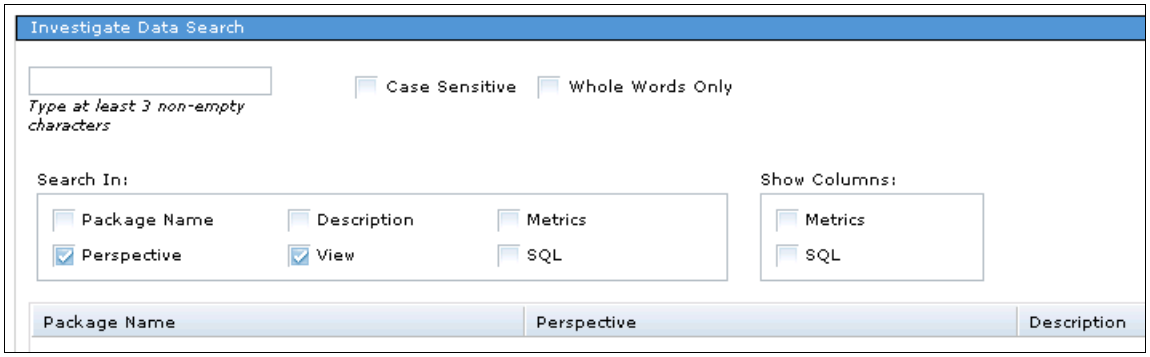

Figure 20 Search options for performance packages

Begin typing in the search field (`disk` in this example). After a delay in text entry, the system automatically searches and shows results based on your search criteria, as shown in Figure 21.

Click the item that you want to use and continue to investigate your system performance.

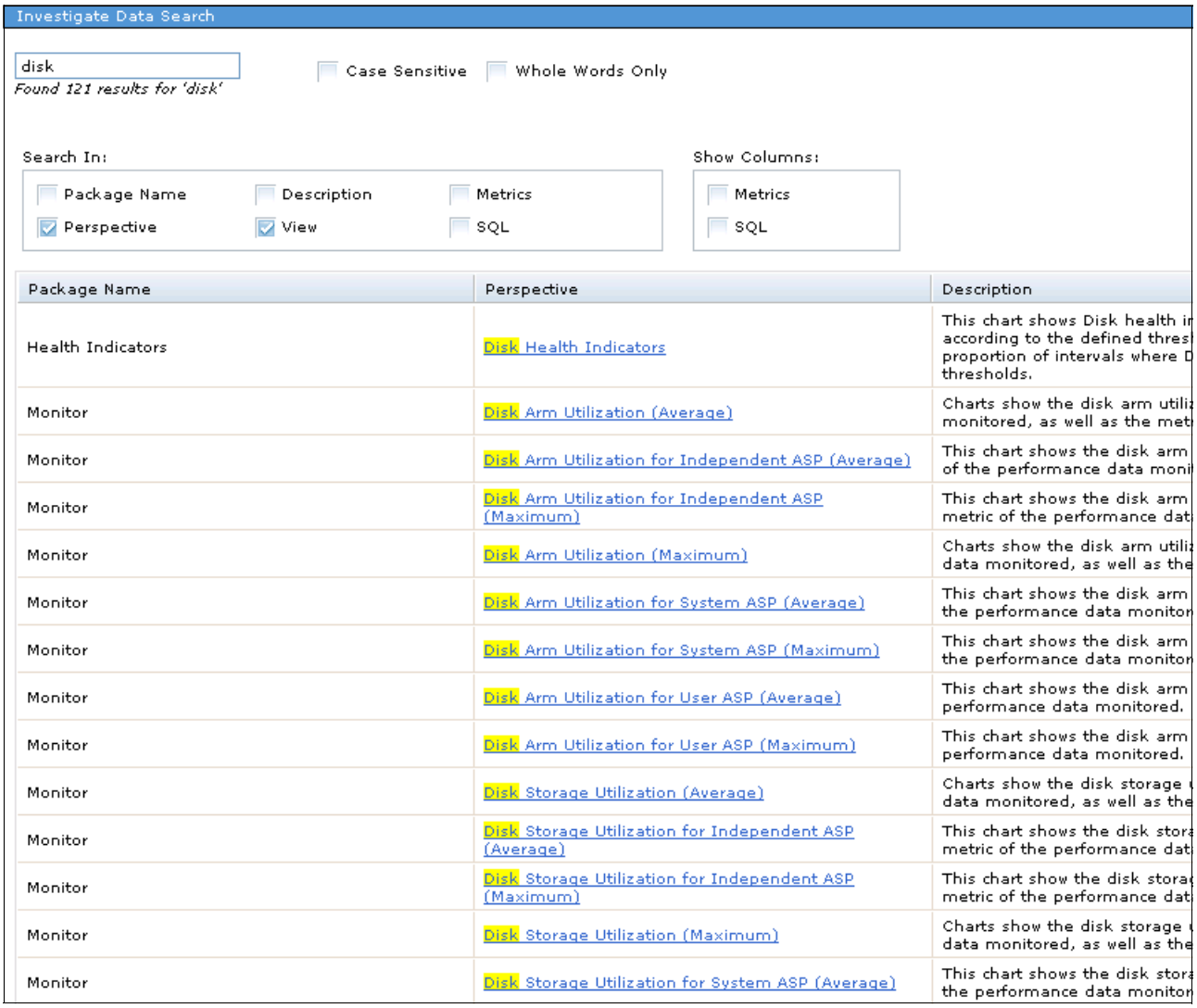

Figure 21 Results of a search for the word “disk”

Resources

The following list of useful resources related to this topic are also helpful:

- IBM i 7.2 documentation in the IBM Knowledge Center

  http://www.ibm.com/support/knowledgecenter/ssw_ibm_i_72/rzahg/ic-homepage.htm
- Performance Management on IBM i information page

  http://www.ibm.com/systems/power/software/i/management/performance/index.html
- Performance Tools wiki on IBM developerWorks®

  http://www.ibm.com/developerworks/ibmi/techupdates/perftools
- IBM i Performance Tools & Performance Data Investigator on IBM developerWorks:

  http://ibm.co/1wwzJwg

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