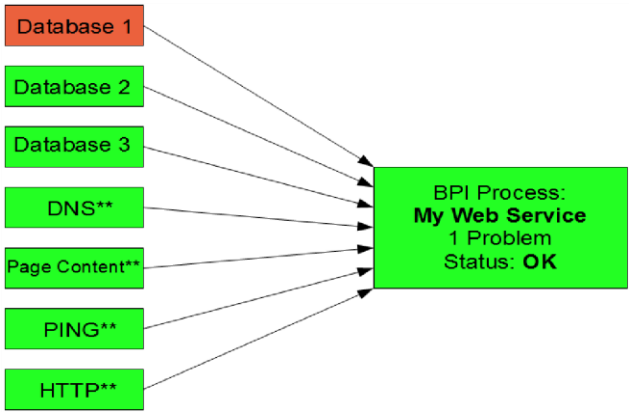
How To Use BPI In Nagios XI 5

Purpose

This document describes how to fully utilize the Nagios Business Process Intelligence (BPI) component for Nagios XI.

If you are using BPI In Nagios 2024, see How to Use Nagios XI BPI 2024

BPI Overview



Nagios BPI was created as a way to visualize business process health by grouping hosts and services together and creating rules to discern the true health of the network infrastructure as it relates to the business. An admin can define rules for each BPI group and monitor the health of the group's state based on what has been defined. This concept is illustrated in the diagram to the right.

For this particular business process, a redundant database solution is being used for a web service. If one of the 3 database servers goes down, there are two more servers in place to act as fail-over solutions. Even though the first server is in a critical state, the actual business process of the web service is still in an OK state because all services required for it to run correctly are still in place.

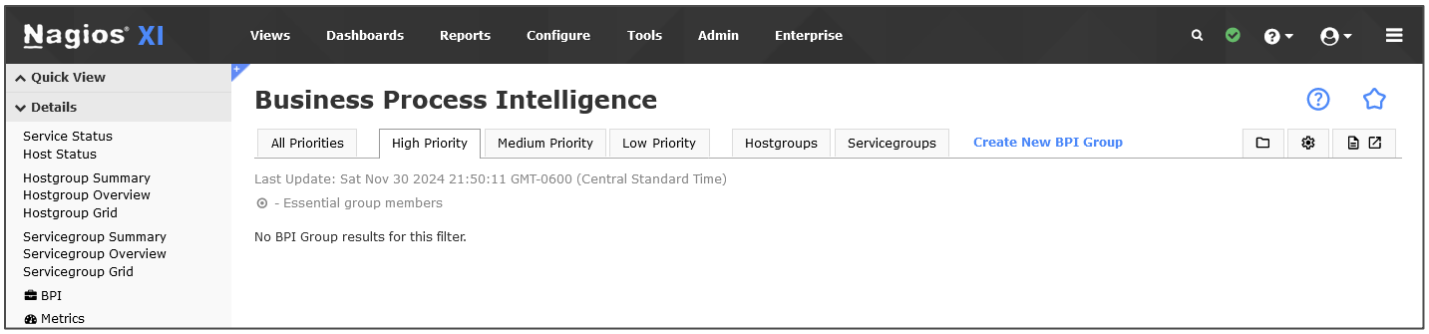
However, if DNS Resolution, Page Content, PING, or HTTP were to stop working for this process, the end user would not be able to utilize the web service. Therefore, we call these services **Essential Members** for this business process, and if any of them failed, the business process would be in a critical state.

In Nagios BPI, Essential Members are denoted with a **target** icon (shown as ** in the diagram above).

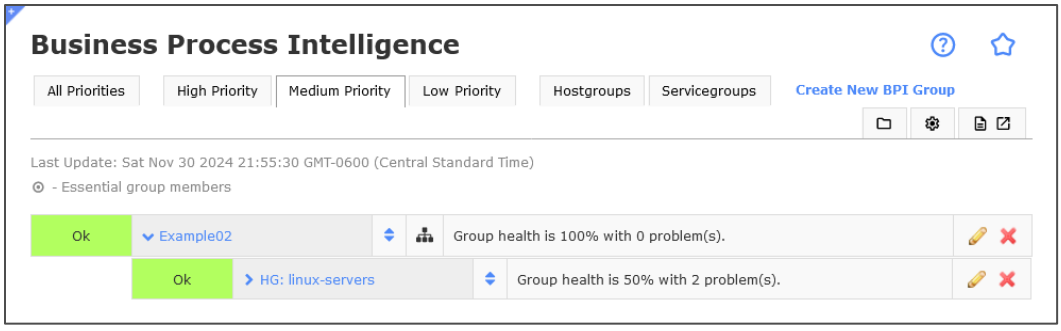
Thresholds can also be set for a group's health percentage. If a "Warning Threshold" of 80% was set for this group, a warning alert would be generated if 2 of the databases were down, even though the business process is still working correctly. The rules for the BPI Group state logic are defined in the Understanding BPI Group Logic section of this documentation.

The BPI User Interface

The BPI interface is accessed by navigating to **Home** > **Details** > **BPI**.

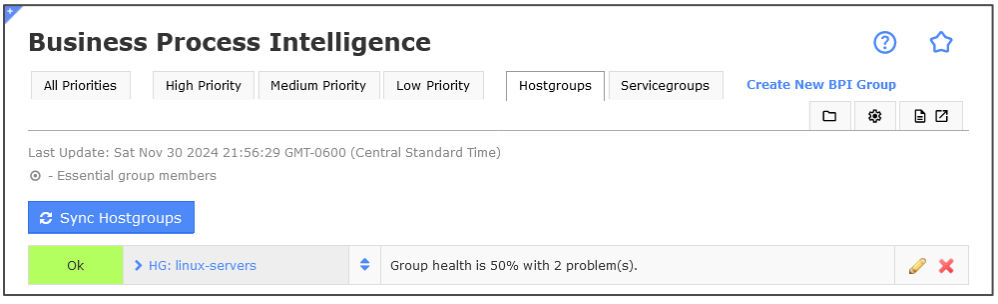


The interface of BPI is broken down by group categories. Each BPI group can be assigned a priority, and groups can automatically be generated from hostgroups or servicegroups. Groups can be expanded to see each of its members, along with their status. Groups can also be members of other groups, so a business process can consist of many groups and can be many levels deep if necessary.



Group members can be sorted by their priority by clicking the **sort** icon.

Clicking the **sort** icon the first time will group the objects by their problem status. Every additional click will sort the items A-Z or Z-A.

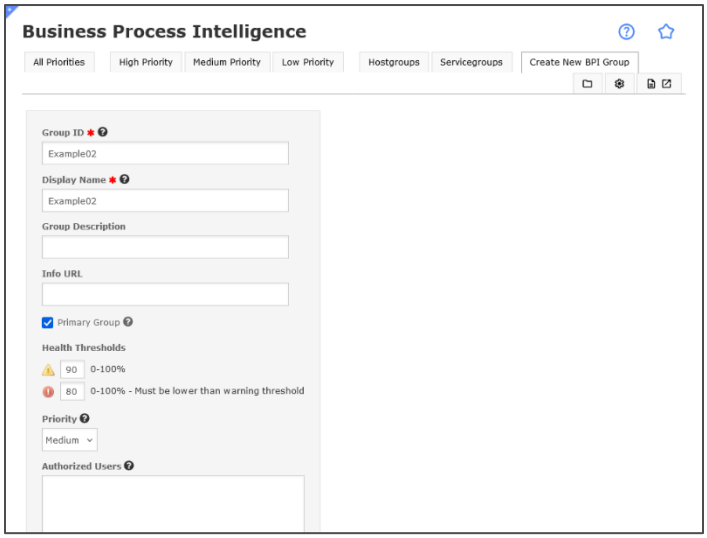


Hostgroups and Servicegroups can be automatically generated or synced by selecting the **Sync Hostgroups** or **Sync Servicegroups** link (depending if you are on the **Hostgroups** or **Servicegroups** tab).

Keep in mind that any changes you make to a hostgroup or servicegroup in **Core Configuration Manager (CCM)** will not be reflected in BPI until you sync the groups again.

Create BPI Group

New BPI Groups can be created by clicking **Create New BPI Group**. Each group property on this page can be explained in detail by clicking the **help icon** next to the form field.



These properties are outlined below:

**Required*

***Group ID:** The Group ID is a unique identifier used internally by Nagios BPI and the check plugin. Only alpha-numeric characters are allowed. Spaces are not allowed.

***Display Name:** The group name that will be displayed to the end-user in the BPI Interface.

Group Description: A text description of the group.

Info URL: A web URL for the group.

Primary Group: Primary Groups are visible on the top level of the tree. Non-primary groups must be added as a child member to a visible group in order to be displayed in the tree.

Warning Threshold: If the health percentage of the group drops below the Warning Threshold, the group state changes to WARNING.

Critical Threshold: If the health percentage of the group drops below the Critical Threshold, the group state changes to CRITICAL and must be a lower number than the Warning Threshold.

Authorized Users: A list of non-administrative users who can view this group. Non-administrative users will only see hosts and services within the groups that they are authorized for, and the group state will be calculated based on the "visible" group members. Admin-level users can automatically see and modify all groups.

***Group Members:** Group Members can be hosts, services, or other groups. "Essential" members can decide the entire group's state. If an essential member's state is in a problem state the parent group is listed as "Critical." If all essential members are in a non-problem state, the group's state is then determined by the threshold settings. To add members, select members from the list above and click the **Add Member(s)** button.

Click the **Write Configuration** button to create the group or update the group if you are editing an existing group.

BPI Permissions Summary

Only Nagios XI admins can add, edit, or remove groups. Each group can have a list of authorized “read-only” users. Non-admin users can view groups that are specifically authorized for in the group definition. If a group has hosts or services in it that a read-only user is not authorized to see, the member will be ignored by that user and will not be calculated for the group's state, nor will it be visible in the user interface.

Important Note: Service checks that for BPI groups calculate the group state based on **all defined members** in the group, as seen by an Admin-level user. It is important in multi-tenancy situations to define BPI groups and service checks in accordance with what the tenant user can actually see. If a user views a BPI group and some its members are being hidden from view, these members will be noted in the **bpi.log** file (defined in the BPI Settings page)

Understanding the BPI Group Logic

The Nagios BPI groups can be a flexible tool for determining a "real" network state for a group of services. Dependencies are highly customizable, and the logic for determining a group state can be defined by the user. The logic for determining group states is explained as follows.

Factors that create a 'Warning' or 'Critical' state:

- **Any** "Essential members" are in a problem state
- The group's health percentage drops below the **Warning Threshold**
- The group's health percentage drops below the **Critical Threshold**

This can be explained clearly with an example. Say you have 3 services for a BPI group in these states:

- OK
- WARNING
- CRITICAL

Nagios BPI will see it like this:

- OK
- PROBLEM
- PROBLEM

Nagios BPI will calculate it like this:

- 100 / Total Number Services in Group = Individual Item Percent

With the example above:

- 100 / 3 = 33.3

33.3 is the weight that each item has (whether OK or in a problem state), BPI would calculate it like this:

- 0
- 33.3
- 33.3

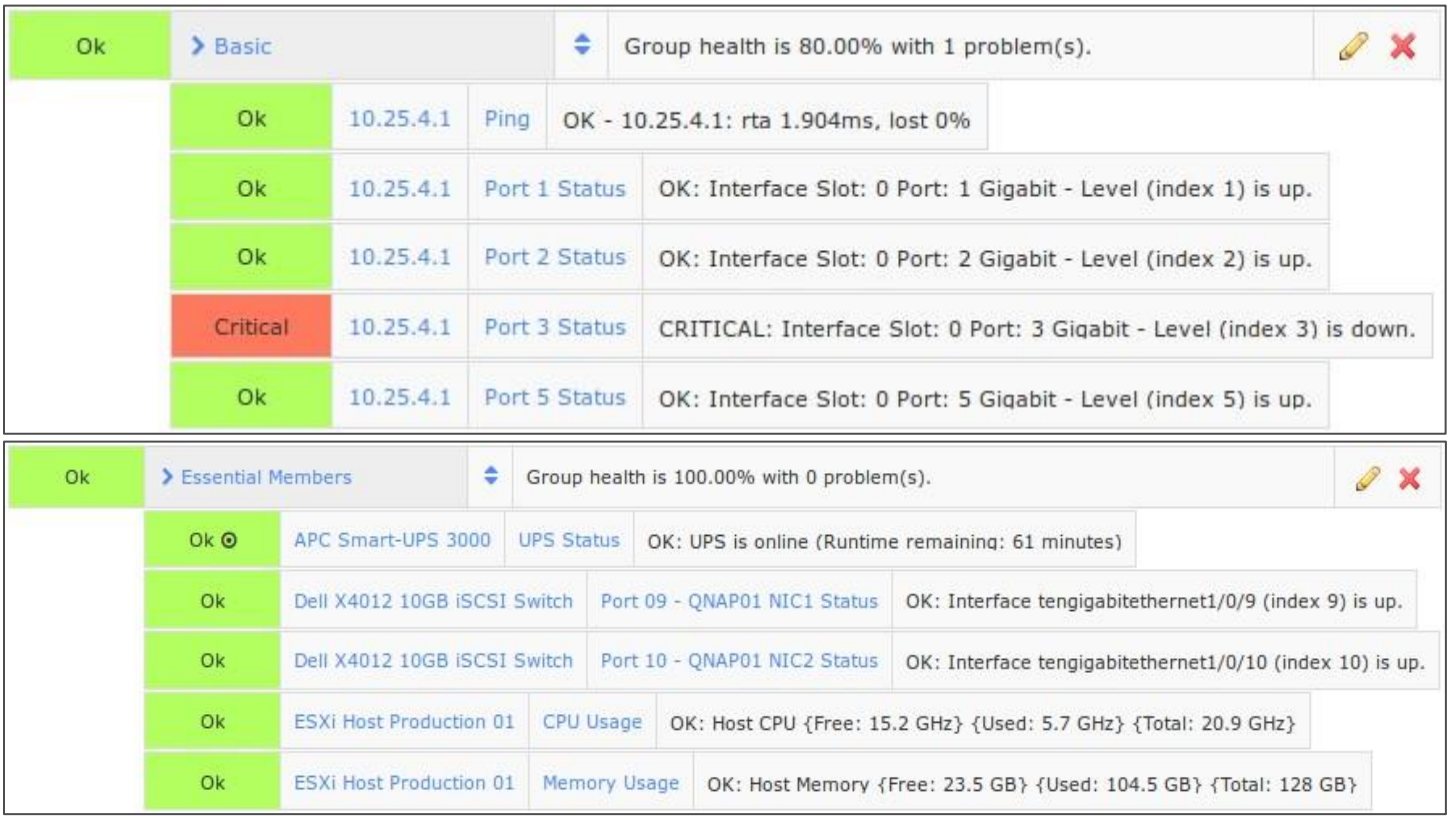
The final calculation is:

- 100 - TOTAL PROBLEM PERCENTAGE = Group Overall Health
- 100 - (33.3 + 33.3) = 33.3% Group Overall Health

You can see that it doesn't matter whether it's a WARNING or a CRITICAL, only that it's in a problem state.

The following page has some examples that relate to screenshots.

A Basic BPI Group



This is a basic group with 5 members. The group has a warning threshold of 70%, and a critical threshold of 60%. Even though the group has one member in a Warning state, the group state is still 'OK' because the health percentage is at 80%.

A Group Using Essential Members

This group has one **Essential Member** defined, which is denoted with a **target** icon next to its state. If an essential member has a problem, the entire group will be in a problem state, even though the thresholds have not been exceeded.

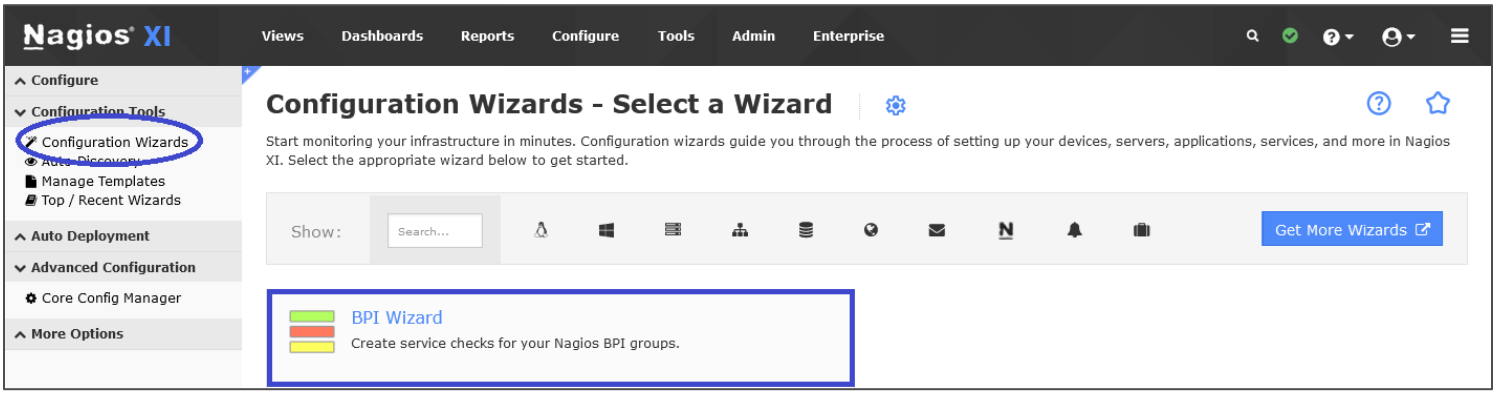
Complex BPI Groups

The BPI groups determine state by looking down only one level. The BPI group will essentially look for the worst state trigger in the group, so if the warning threshold is exceeded for a group, but an essential member is "critical", the group will still be "critical".

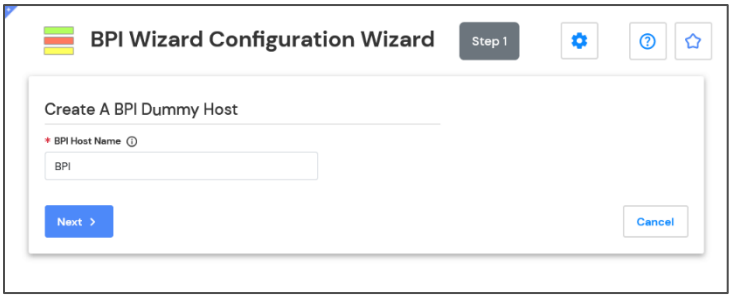
There is no limit to the number of sub-groups that can be created, you can define as many levels in your dependency tree as you want.

Service Checks for BPI Groups

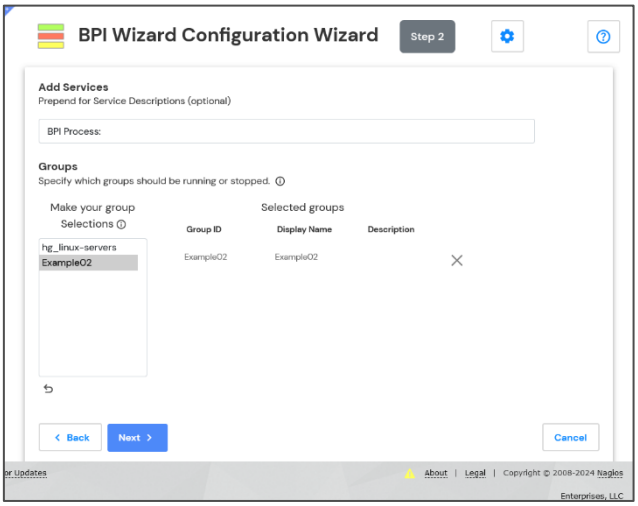
Once you've created your BPI groups, to receive notifications when their thresholds are exceeded, you need to create services. The BPI wizard can be used to create these services. Navigate via the top menu bar to **Configure** > **Run a configuring wizard** and select the **BPI** wizard. In the following screenshot you can see how the search field allows you to quickly find a wizard.



On Step 1 you will be asked to supply the **BPI Host Name**. This is a "dummy" host object your BPI service(s) will be assigned to.



Click **Next** to progress to step 2.

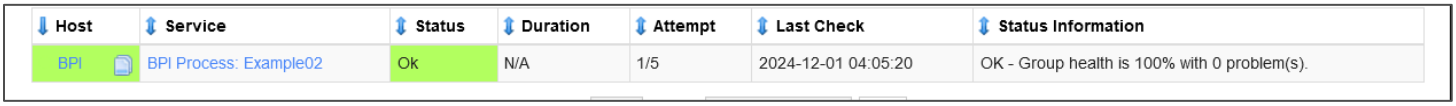


On Step 2 the wizard will automatically populate your list of BPI groups that you can run checks against, and group states will be determined by the same logic and thresholds used in the BPI user interface.

You can also define some text that will be prepended to the names of the services created.

Click **Next** and then complete the wizard by choosing the required options in Step 3 – Step 5.

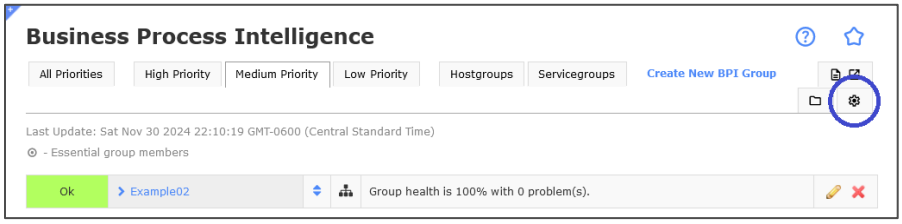
To finish up, click on **Finish** in the final step of the wizard, this will create the new hosts and service and begin monitoring. Once the wizard applies the configuration, click the **View status details for xxxxx** link to see the new host and services that were created.



You can see that the service is in a critical condition, which means a notification will be sent to the appropriate recipients.

BPI Settings

If you require to change any of the BPI settings, they can be accessed using the **Edit BPI Settings** button.



Most of these settings do not require modification, they are here for advanced users of BPI. However, a setting worth mentioning is **Logic Handling For Problem States**. If this box is checked, Nagios BPI will ignore any problems states that are either **Acknowledged** or in **Scheduled Downtime**.

You can also change the format of the **Status Text** that BPI uses in it's screens. The information on the settings screen is self-explanatory and does not need duplicating here.

After making any changes, click **Apply Settings**.

Manually Edit Config

Advanced BPI users may find the manual edit feature helpful. This is the raw config file, and as per the warning on the page, "Advanced Users Only: Do NOT make changes to this file unless you know what you're doing!".

After making any changes, click **Save Configuration**.

XML Output

When service checks are run, the first time a BPI service check is run the BPI Group states are dumped to the `/usr/local/nagiosxi/var/components/bpi.xml` file. The service check tests the file age of the XML file, and if the age threshold is exceeded, a new file will be made. Otherwise, the check plugin will used the cached results in the XML file. This file can also be used as a data API for use with external applications.

Troubleshooting

For administrative users, Nagios BPI will dump error output to the browser and will generate links to fix the configuration issues. For read-only user, the errors will be suppressed and sent to the `/usr/local/nagiosxi/var/components/bpi.log` file.

Finishing Up

This completes the documentation on using BPI in Nagios XI. If you have additional questions or other support-related questions, please visit us at our Nagios Support Forum, Nagios Knowledge Base, or Nagios Library:

Visit Nagios Support Forum Visit Nagios Knowledge Base Visit Nagios Library