

# How to create a fixlet

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## Arguments

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## Introducing Fixlets and Tasks

**Fixlets** and **Tasks** are central to the functionality of Tivoli Endpoint Manager. Using Relevance statements, they target specific computers, remediating just those Tivoli Endpoint Manager Clients afflicted by an issue and never bothering those that aren't. They are both packaged with an Action script that can resolve the issue with a simple mouse-click.

Fixlets and Tasks differ mainly in how they get resolved.

A **Fixlet** is triggered by a **Relevance clause** that detects a vulnerability. When an Action is invoked to remediate the vulnerability, the Fixlet automatically loses relevance and is thus no longer applicable on that specific Tivoli Endpoint Manager Client. As a Fixlet Action propagates through your network, you can track its progress with the Console, Web Reports and the Visualization Tool. Once every Tivoli Endpoint Manager Client in your network has been remediated, the Fixlet is no longer relevant and it disappears from the list. Should the issue reappear, the Fixlet will reappear in the list, ready to address the issue again.

A **Task** comes with one or more Action scripts that help you adjust settings or run maintenance tasks. It generally stays relevant after its Action script has been executed. Tasks are designed for reapplication and as a consequence, they are often persistent.

Both Fixlets and Tasks may have a **Default Action**, allowing you to simply click from the list to deploy it. They can both be grouped into Baselines, allowing higher levels of automation. If you create a Baseline of Fixlets or Tasks which all contain default Actions, you can turn the tedious chores of maintaining a corporate policy or common operating environment into a single-click operation. In typical operation, Fixlet relevance contributes to the overall baseline relevance; Task relevance does not. Similarly, Actions created from a Baseline can be composed of both Fixlet and Task Actions, and typically only the relevance of the Fixlet Actions will contribute to the decision to execute the group. These are defining features of Fixlets and Tasks. The following table summarizes the differences:

## Introducing Fixlets and Tasks

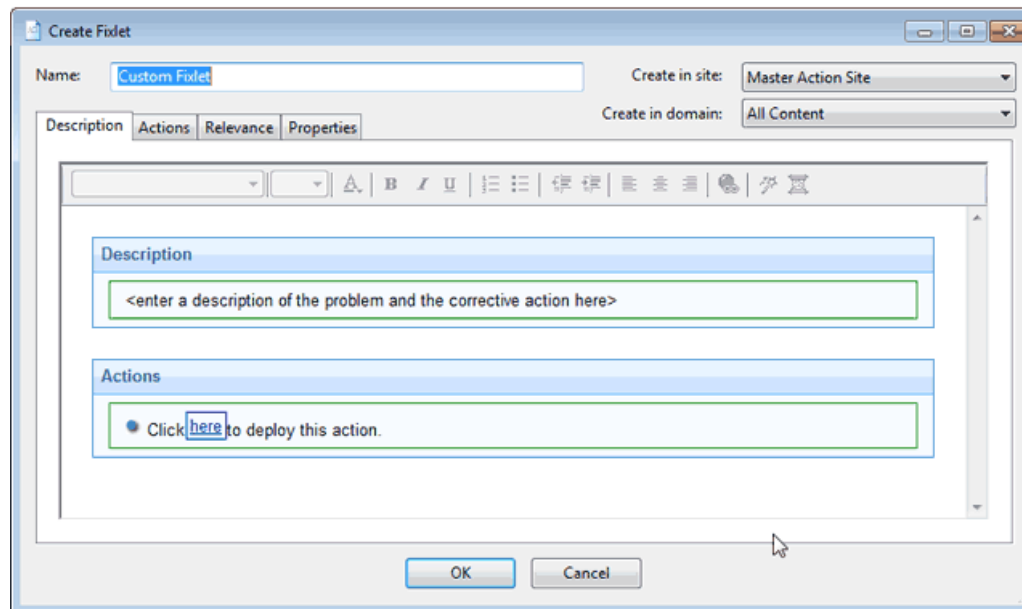
	Fixlet message	Task
Relevance interpretation:	Machine is in remediable state	Action is available to execute in this context
To establish success of remediation:	Relevance becomes false	Action executes to completion
Contributes to Baseline Relevance?	Yes	No
Contributes to Group Action execution?	Yes	No

At any time, you can open a Fixlet or Task to inspect the underlying Relevance expressions that are used to target the Clients, as well as the Action script(s) that are designed to address the issue. The language is human-readable to give you a high degree of confidence in both the applicability the trigger and efficacy of the remedial Action. You can also see exactly which computers on your network are affected by each Fixlet or Task. Once propagated, you can then view the progress and ultimate history of each Action taken on a Client-by-Client basis.

## Creating or Customizing Fixlets and Tasks

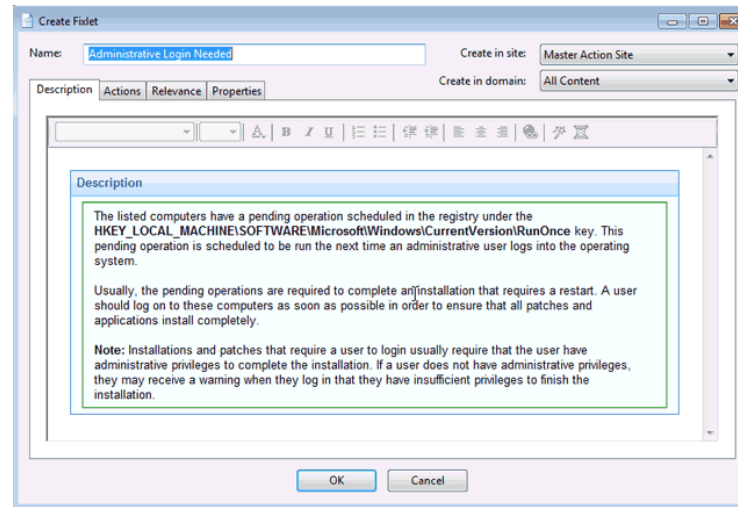
To create your own custom Fixlet or Task message from scratch,

Select Tools > Create New Fixlet or Task. This brings up a creation dialog with blank fields for you to fill in.



You may also wish to customize a Fixlet or Task. You can do this by cloning and modifying an existing one. To do so, first select the desired Fixlet or Task from the List Panel, then select Edit > Create Custom Copy (or right-click the item and select Create Custom Copy from the context menu). The appropriate creation dialog appears, only this time it is filled with the original content.

# Creating or Customizing Fixlets and Tasks



Either way, the Create dialog provides the same options. Enter the name of your customized message in the top left text box. This will serve as the title when the Fixlet or Task is displayed. You can use the name for sorting and filtering, so it's worth creating a consistent naming convention to make your content more manageable.

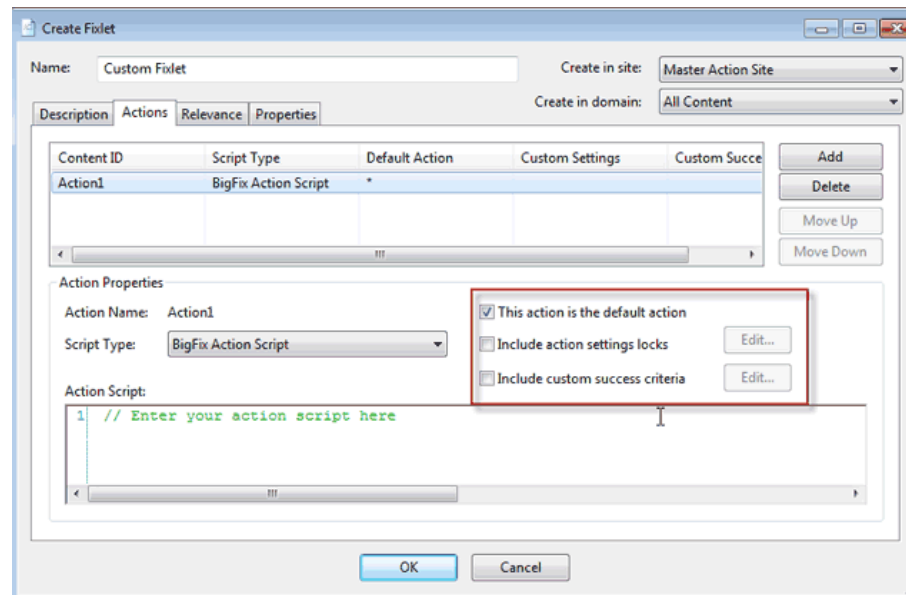
Choose the Site and Domain to host it from the drop-down menus, upper right.

Next, click through each of the tabs to further define your Fixlet or Task.

**Description:** Enter your descriptive text in this box. You can use the text manipulation toolbar at the top of the dialog to enhance the formatting.

**Actions:** Define your action in this dialog. Use the buttons at the right to add, delete or change the position of the action. Below that is an area to customize the properties of the action. Choose the Script Type from the drop-down menu. Below that is a text box where you can enter a new action script or modify the original.

## Creating or Customizing Fixlets and Tasks



There are three check boxes you can use to modify the action:

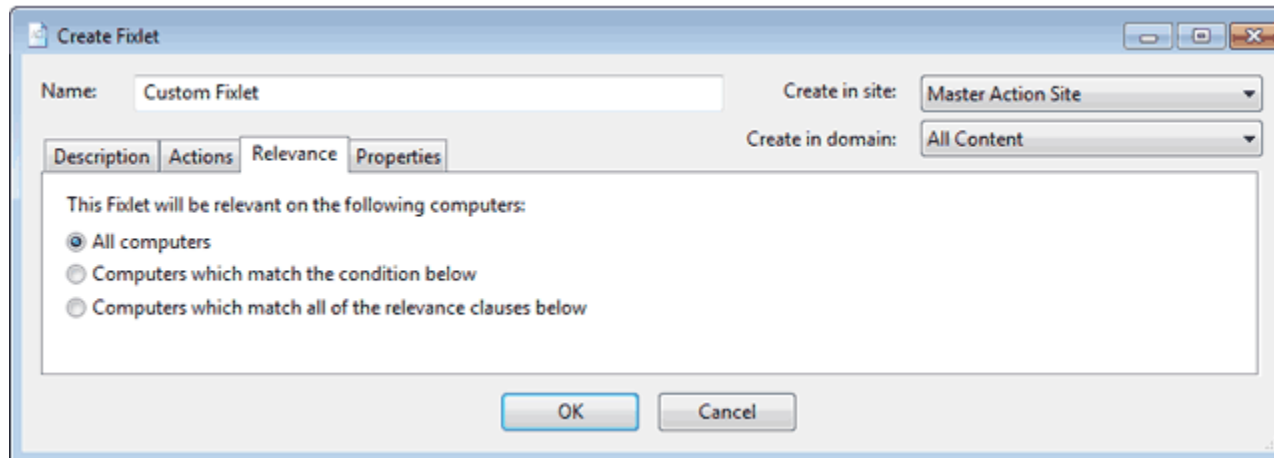
**This action is the default action.** Click this box to create a **default action**.

**Include action settings locks.** Click the Edit box to the right of this check box to customize the action setting locks, including start time, end time, day exclusions and more. This screen also includes failure and reapplication behaviors.

**Include custom success criteria,** which allows you to specify the conditions that will define the success of the action.

## Creating or Customizing Fixlets and Tasks

**Relevance:** Simply leave the default of applying to **All computers**, or click a different button and enter a condition or a relevance statement in the dialog below. This is how you target your Fixlet or Task to relevant computers. For more information on the relevance language, refer to the **Inspector Libraries**.





## Creating or Customizing Fixlets and Tasks

**Properties:** Set the properties of your Fixlet or Task, including the category, download size, date, severity and more. You can also include the SANS (SysAdmin, Audit, Network, Security) or CVE (Common Vulnerabilities and Exposures) ID numbers.

The screenshot shows the 'Create Fixlet' dialog box. The 'Name' field contains 'Custom Fixlet'. The 'Create in site' dropdown is set to 'Master Action Site' and the 'Create in domain' dropdown is set to 'All Content'. The 'Properties' tab is active, showing the following fields:

- Category: [Empty]
- Download Size: [Empty]
- Source: Internal
- Source ID: [Empty]
- Source Release Date: 12/2/2010
- Source Severity: [Empty]
- CVE ID: [Empty]
- SANS ID: [Empty]

Buttons for 'OK' and 'Cancel' are located at the bottom of the dialog.

When you are satisfied with your definitions, click **OK**. Your Fixlet or Task needs to be propagated, so you will be prompted for your private key password. Once you enter it and click **OK**, it will be sent to all the Clients, which will evaluate it for relevance and report back their status. You will then be able to follow the deployment of your new content in real-time from the Console.

## Create Fixlet and Task

The **Create Fixlet** and **Create Task** dialogs are similar and allow you to create or customize a Fixlet or Task.

There are several tabs to help you define or edit your Fixlet or Task.

**Description:** Enter your descriptive text in this box. You can use the text manipulation toolbar at the top of the dialog to enhance the formatting.

**Actions:** Define your action in this dialog. Use the buttons at the right to add, delete or change the position of the action. Below that is an area to customize the properties of the action. Choose the **Script Type** from the drop-down menu. Below that is a text box where you can enter a new action script or modify the original. There are three check boxes you can use to modify the action:

**This action is the default action.** Click this box to create a **default action**.

**Include action settings locks.** Click the Edit box to the right of this check box to customize the action setting locks, including start time, end time, day exclusions and more. This screen also includes failure and reapplication behaviors.

**Include custom success criteria,** which allows you to specify the conditions that will define the success of the action.

**Relevance:** Simply leave the default of applying to **All computers**, or click a different button and enter a condition or a relevance statement in the dialog below. This is how you target your Fixlet or Task to relevant computers. For more information on the relevance language, refer to the **Inspector Libraries**.

**Properties:** Set the properties of your Fixlet or Task, including the category, download size, date, severity and more. You can also include the SANS (SysAdmin, Audit, Network, Security) or CVE (Common Vulnerabilities and Exposures) ID numbers.

# Introducing the Relevance Language

BigFix allows large networks of computers to be easily monitored and patched in real time using Fixlet® technology. Fixlet messages inspect client computers and report back to relays that in turn report to central servers. This allows patches and updates to be efficiently applied to just those computers that need it, and no others. It also allows the retrieval of various computer properties that can be collected and charted.

The heart of the Fixlet technology is the **Relevance Language** that allows authors to interrogate the hardware and software properties of your managed clients. With the Relevance language, you can write expressions describing virtually any aspect of the client environment. Some Fixlet messages are simply designed to return Relevance information to the servers, but most of them suggest **Actions** that can patch or update the client computer. The Actions, in turn, also take advantage of Relevance expressions.

Fixlet messages and Relevance expressions by themselves can only notify the administrator. Actions, on the other hand, are specifically designed to modify the client, so there is a clear dividing line between a Relevance expression and its associated Action – typically a human is required to deploy the Action.

Dividing the labor in this fashion, using Relevance clauses to benignly inspect the client and Actions to fix them (upon approval), the BigFix applications provide an unprecedented degree of both safety and power.

Relevance expressions are designed to be human-readable. This allows users and administrators to examine them before deploying any associated Actions. The language gives you access to thousands of methods and properties known as BigFix Inspectors. The values returned by the Inspectors can be used for calculations and comparisons, allowing the Fixlet to determine relevance and target a computer for action.

<p><b>Relevance</b></p> <pre>11 as a Month</pre>	<p><b>Relevance</b></p> <pre>5 &gt; 9</pre>	<p><b>Relevance</b></p> <pre>exists files ("C:\license.crt")</pre>	<p><b>Relevance</b></p> <pre>files whose (name of it starts with "x") of system folder</pre>
<p><b>Output</b></p> <pre>November</pre> <p>Evaluation time: 0.196 ms</p>	<p><b>Output</b></p> <pre>False</pre> <p>Evaluation time: 0.179 ms</p>	<p><b>Output</b></p> <pre>True</pre> <p>Evaluation time: 2.231 ms</p>	<p><b>Output</b></p> <pre>"xactsrv.dll" "5.2.3790.3959" "Downlevel API Server DLL" "5.2.3790.3959 (srv03_sp2_rtm.070216-1710)" "Microsoft Corporation" "xcopy.exe" "5.2.3790.3959" "Extended Copy Utility" "5.2.3790.3959 (srv03_sp2_rtm.070216-1710)" "Microsoft Corporation" "xencoll.dll" "5.131.3686.0" "Xenroll" "5.131.3686.0 (dserv.020925-1223)" "Microsoft Corporation" "xmlite.dll" "1.0.1018.0" "Microsoft XmlLite Library" "1.00.1018.0" "Microsoft Corporation" "xmlprov.dll" "5.2.3790.3959" "Network Provisioning Service" "5.2.3790.3959 (srv03_sp2_rtm.070216-1710)" "Microsoft Corporation" "xmlprov.dll" "5.2.3790.3959" "Network Provisioning Service Client API" "5.2.3790.3959 (srv03_sp2_rtm.070216-1710)" "Microsoft Corporation" "xolehip.dll" "5.2.3790.3959" "MS DTChealer APIs DLL" "2001.11.4720.3959 (srv03_sp2_rtm.070216-1710)" "Microsoft Corporation" "xpob2res.dll" "5.2.3790.3959" "Service Pack 2 OOB Messages" "5.2.3790.3959 (srv03_sp2_rtm.070216-1710)" "Microsoft Corporation" "xpob2res.dll" "5.2.3790.3959" "Service Pack 2 Messages" "5.2.3790.3959 (srv03_sp2_rtm.070216-1710)" "Microsoft Corporation"</pre> <p>Evaluation time: 2145.233 ms</p>

## Sample [1/2]

Fixlet name:

**925336: Update for Windows Installer - Windows Server 2003 SP1/SP2**

Relevance clauses:

- **if( name of operating system starts with "Win" ) then platform id of operating system != 3 else false**
- **(language of version block of file "kernel32.dll" of system folder contains "English") OR (exists value of key "HKLM\System\CurrentControlSet\Control\Nls\MUILanguages" of registry)**
- **not exists key "HKLM\Software\Wow6432Node\Microsoft\Windows\CurrentVersion" whose (exists value "ProductId" of it OR exists value "CommonFilesDir" of it) of registry AND not exists values "PROCESSOR\_ARCHITECTURE" whose (it as string as lowercase = "ia64") of keys "HKLM\SYSTEM\CurrentControlSet\Control\Session Manager\Environment" of registry**  
*(The 'whose' clause allows you to filter a result or set of results based on specified relevance criteria. It has the form: <list> whose <filter expression> )*
- **(name of it = "Win2003" AND (service pack major version of it = 1 OR service pack major version of it = 2)) of operating system**
- **((exists file "advapi32.dll" whose ((version of it < "5.2.3790.2895" AND service pack major version of operating system = 1) OR (version of it < "5.2.3790.4036" AND service pack major version of operating system = 2)) of it)) of (system folder))**
- **(not exists key "hkml\software\microsoft\updates\windows server 2003\sp3\kb925336" of registry)**

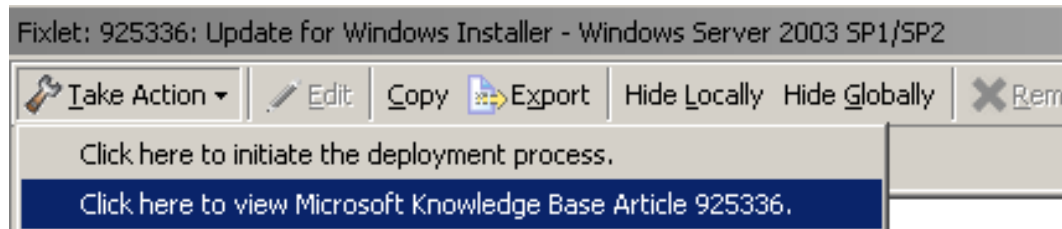
## Sample [2/2]

### Actions:

- **download** <http://download.microsoft.com/download/e/6/6/e662b0fe-6ac9-4941-977b-4807496b4d2a/WindowsServer2003-KB925336-x86-ENU.exe>
- **continue if** `{{(size of it = 894856 AND sha1 of it = "d61fddb7ad7e51ec926d22eefcfeecac4c1fcd9") of file "WindowsServer2003-KB925336-x86-ENU.exe" of folder "__Download"}}`
- **waithidden** `__Download\WindowsServer2003-KB925336-x86-ENU.exe /quiet /norestart`
- **action may require restart** `"d61fddb7ad7e51ec926d22eefcfeecac4c1fcd9"`

### Links:

- <http://support.microsoft.com/kb/925336>



## Usefull Links

- [Fixlet Authoring](#)
- [BigFix Actions](#)
- [TEM Utilities](#)

## Questions & Answers



# Backup



## Basics

This presentation is designed to train experienced BES Console Operators in the creation of custom content using the BES Console.

By the end of the presentation, the attendees will have the knowledge necessary to create the following objects:

- Custom Actions
- Custom Retrieved Properties
- Custom Tasks
- Custom Fixlets

The presentation will cover the following topics:

- Creating and Activating Retrieved Properties
- Writing Simple Queries in the BigFix Relevance Language
- Writing Scripts using the BigFix Action Language
- Creating Custom Actions, Tasks, and Fixlets

## Types of Custom Content

- What is a Fixlet® message?
- Fixlet messages Vs. BES Tasks
- BES Retrieved Properties
- BES Custom Actions

## What is a Fixlet® message?

The BigFix system is a powerful support technology that allows you to create “Intelligent” messages, which identify problems on a computer, and offer them a single-click solution. Fixlet messages are created using the BigFix Development Environment or the BES Console, and are generally simple and quick to produce. It is useful to think of a Fixlet message as the sum of three constituent parts: Fixlet Relevance, Fixlet Body, and Fixlet Action.

**Fixlet Relevance** is the “brain” of the Fixlet message that identifies specific problem conditions that the Fixlet describes and fixes. Fixlet Relevance is written in the BigFix Relevance Language, and it allows Fixlet messages to target only computers with specific characteristics that indicate it has a problem. A Fixlet is defined as ‘Relevant’ for a certain computer if all of its relevance statements return True for that specific computer.

**Fixlet Body** is the text (which can be formatted using standard HTML) of the Fixlet message, which explains the problem and gives the user any pertinent information they may need. The body should be concise, containing only important information.

**Fixlet Action** is the process that solves the problem, allowing the user to click on a single link to resolve the issue quickly and simply. A Fixlet action may only be taken on a computer where the Fixlet is relevant.

## Fixlet messages Vs. BES Tasks

BES Tasks are essentially the same as Fixlet messages, but they are a different category for organizational purposes. By definition, Fixlet messages are meant to be an identification and remediation of a problem. When the action of a Fixlet message is taken, it should 'solve' the problem. BES Tasks, on the other hand, perform maintenance and management functions that don't necessarily address problems. For instance, BES Tasks can be used to deploy software, restart services, or run backups. BES Tasks have the same makeup as a Fixlet messages (relevance, actions, and body), and they interact with the BES Console and BES Clients in essentially the same manner. The only functional difference is that by default Fixlet actions will report back as 'Fixed' once their relevance has falsified, while by default Task actions will report back as 'Fixed' once all lines of its action have completed. For historical purposes,

The screenshot displays the BigFix Patch Manager interface. The main window shows a Fixlet message titled "MS04-012: Cumulative Update for Microsoft RPC/DCOM - Windows 2000" with a severity of "Critical". The message body describes a patch for vulnerabilities in RPC/DCOM. The "Default Action" section is visible on the right, showing a list of relevance conditions:

```
1: name of operating system = "Win2000"
2: csd version of operating system = "Service Pack 2" OR csd version of operating system = "Service Pack 3" OR csd version of operating system = "Service Pack 4"
3: not exists key "HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Updates\Windows 2000\SP5\KB828741" of registry
4: exists file "Catsrv.dll" whose version of it < "2000.2.3511.0" of it OR exists file "Catsrvul.dll" whose version of it < "2000.2.3511.0" of it
```

## BES Retrieved Properties

Retrieved properties are an essential part of the BigFix Enterprise Suite. BES Retrieved Properties are certain pieces of information that are gathered from each BES Client and stored in the database on the BES Server. This information is displayed in the BES Console and can be used to define management rights for BES Console operators and target actions to specific subsets of computers.

Retrieved properties are written in the BigFix Relevance Language. Each Retrieved Property is simply a return value of a query written in the BigFix Relevance Language.

## BES Custom Actions

A BES Custom Action contains the main constituent parts of a Fixlet message or BES Task, but is not saved for future application. When you write a BES Custom Action, you write the relevance and action scripts, and immediately send out the action to targeted computers. In general, you should only use a BES Custom Action if you want to perform a quick task that you only need to do once. Otherwise, it would be better to take advantage of the increased functionality of a Fixlet message or BES Task.