

IBM Features on Demand



User's Guide

IBM Features on Demand



User's Guide

Note: Before using this information and the product it supports, read the general information in Appendix B, “Notices,” on page 55.

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Chapter 1. Introduction

This document provides an overview of the IBM® Features on Demand program and the feature activation process. Features on Demand is the capability to activate or “unlock” features that are integrated in System x products. The feature is in the firmware or software but is “locked” until the activation key is installed.

Features on Demand provides the capability to activate a feature on a server or option with a software key that is referred to as the Features on Demand activation key. Features on Demand features are usually integrated in firmware or software on a server or option, but the feature is “locked” until the Features on Demand activation key is installed. If you purchase a server and a Features on Demand option, manufacturing can install the Features on Demand activation key on the server so that the Features on Demand function is ready for you to use when you receive the server. A Features on Demand option can also be ordered anytime after your initial server purchase just like other IBM options. Features on Demand enables you to buy the features that you need now with the ability to enhance your system later without costly hardware upgrades.

The Features on Demand feature is activated in one of the following ways:

- If you purchase a feature as part of a server or chassis order, the IBM factory or business partner enables the feature as part of the configuration and testing of the server or chassis. You can begin using the feature when you receive the server or chassis.
- If you purchase a Features on Demand option or upgrade that is separate from the server or chassis order, you must complete the feature activation when you install the option. In this case, an authorization code with instructions for activating the feature is mailed to you.

An authorization code is a 22-character alphanumeric string that is the proof of purchase and entitlement to upgrade one or more units with a particular feature. The authorization code and instructions for requesting an activation key are on a printed document that is mailed to you. If you order directly from IBM, the authorization code and instructions can also be sent to the email address that you provide when you register on the Features on Demand website. For more information, see “Registering with IBM” on page 5.

Features on Demand is also supported on certain hardware and software options offered by IBM. To check whether a Features on Demand option is available for your hardware or software option, see the documentation that comes with the option.

Important: The customer is responsible for purchasing Features on Demand features, installing activation keys, and reactivating keys after a hardware replacement.

Overview

There are four types of Features on Demand features:

- Server-based features
- Chassis-based features
- I/O Modules or switch features
- Software features

The Features on Demand website is the primary interface that is used to register with IBM for Features on Demand, activate keys, retrieve key history, generate a report, and much more. IBM ToolsCenter has two utilities, the IBM Advanced Settings Utility (ASU) and IBM Dynamic System Analysis (DSA), that you can use to manage and reactivate your Features on Demand keys. There are manual methods that you can also use to install or remove an activation key. More information about using these tools is provided in Chapter 2, “Using the IBM Features on Demand website,” on page 5 and Chapter 3, “System feature activation,” on page 19.

The following table provides guidance for determining which tools to use for the different types of Features on Demand features.

Table 1. Tools to use for each Features on Demand feature type

Features on Demand type	Administration point	Tools	Protocols	Examples
Server-based	Integrated Management Module II (IMM2)	<ul style="list-style-type: none">• Key Management System (KMS) website• ASU and DSA• IMM2 web interface	<ul style="list-style-type: none">• Intelligent Platform Management Interface (IPMI)• Keyboard Controller Style (KCS)• Common Information Model (CIM)	Server functions, for example: <ul style="list-style-type: none">• IMM2 Advanced• RAID features• Network features
Chassis-based	Chassis Management Module (CMM)	<ul style="list-style-type: none">• KMS website• ASU and DSA	CIM	Chassis features like BladeCenter Open Fabric Manager (BOFM)
I/O module	Management Information Base (MIB)	ASU	Simple Network Management Protocol (SNMP)	Switch features
Software-based		See the software documentation.		IBM System Networking Distributed Switch 5000V

Managing the Features on Demand features

There are several tools available for you to manage the Features on Demand features. The Features on Demand website (<http://www.ibm.com/systems/x/fod/>), also referred to as Key Management System (KMS), provides a user interface for creating and retrieving keys and is the repository of Features on Demand key information and history. Use the Features on Demand website to register users, activate keys, retrieve keys or authorization codes, and generate reports. The Features on Demand website is used with all Features on Demand feature types. Chapter 2, “Using the IBM Features on Demand website,” on page 5 provides detailed information about the Features on Demand website.

IBM ToolsCenter has two utilities, Advanced Settings Utility (ASU) and Dynamic System Analysis (DSA), to help you manage your Features on Demand activation keys for server-based, chassis-based, and I/O module-based features. These utilities are used to acquire and download keys from the Features on Demand website, install and remove Features on Demand activation keys, to reactivate keys after a hardware replacement, export keys for backup, and report on available keys. For an overview of the ToolsCenter utilities, see “Using IBM ToolsCenter utilities to manage Features on Demand activation keys” on page 25.

In addition to the Features on Demand website, tools, and applications, you can also manually manage the Features on Demand keys. For more information about using the IMM2 web interface to manage server-based Features on Demand keys, including how to reactivate keys after a hardware replacement, see “Manually installing a Features on Demand activation key on the IMM2” on page 20 and “Manually removing a Features on Demand activation key on the IMM2” on page 23.

For software-based features, use the method that is specified in the software documentation.

System requirements

To activate a Features on Demand feature, you must have a hardware or software offering from IBM that supports Features on Demand. Servers must have the Integrated Management Module II (IMM2) to support Features on Demand.

To manage hardware-based Features on Demand features, you can interact directly with the hardware (for example, a server, chassis, or I/O module) through its supported user interfaces, or you can use IBM Systems Director or the IBM ToolsCenter utilities. For more information about IBM Systems Director, see the information center at http://publib.boulder.ibm.com/infocenter/director/v6r1x/index.jsp?topic=/director_6.1/fqm0_main.html. For more information about the IBM ToolsCenter, see the information center at <http://publib.boulder.ibm.com/infocenter/toolsctr/v1r0/index.jsp>.

To manage software Features on Demand that are independent of the hardware, you can interact with the software-provided interface for managing product activation. For specific details about how to access product activation information, see the software product documentation.

Notices and statements in this document

The following notices and statements are used in this document:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage might occur.

Chapter 2. Using the IBM Features on Demand website

The IBM Features on Demand website is at <http://www.ibm.com/systems/x/fod/>. You can use the website to perform the following tasks:

- Register with IBM
- Activate a feature
- Retrieve history and reactivate a Features on Demand feature
- Manage an IBM customer number
- Retrieve an authorization code
- Generate a report

Note: Your IBM ID and password are required to log in to the Features on Demand website. If you are not registered with IBM, go to <http://www.ibm.com/systems/x/fod/> and click **register** on the bottom of the page.

Registering with IBM

If you are not registered with IBM, complete the following steps:

1. Go to <http://www.ibm.com/systems/x/fod/> and click **register** on the bottom of the page. The My IBM Registration page opens.

The screenshot shows the 'My IBM registration' page, Step 1 of 2. The page has a dark blue header with the IBM logo and a search bar. Below the header is a navigation bar with links: Home, Products, Services & industry solutions, Support & downloads, and My IBM. On the left side, there is a sidebar with links: My IBM profile, My IBM registration (selected), Help and FAQ, and Help desk. The main content area is titled 'My IBM registration' and 'Step 1 of 2'. It contains a paragraph explaining that fields with an asterisk (*) are required. Below this, there is a section for 'Preferred language for profiling : English'. A paragraph follows, stating that IBM has sold its PC business to Lenovo Group Ltd. and that the user's ID and password will provide access to both IBM and Lenovo web sites. Another paragraph asks the user to submit the following information, which is required each time they sign in. A reminder states that the user can't change their IBM ID once they've signed up. The form then asks for the following information: * IBM ID (with a link to 'Why do I have to provide an email address as my IBM ID?'), * Password (Minimum 8 characters), * Verify password, * Security question, * Answer to security question, * Email, and * Country/region of residence (with a dropdown menu). At the bottom, there is a checkbox for 'Please do not associate my preference and interest with my identification information.' and two buttons: 'Continue' and 'Cancel'.

IBM

Home Products Services & industry solutions Support & downloads My IBM

My IBM profile
My IBM registration
Help and FAQ
Help desk

My IBM registration

Step 1 of 2

The fields indicated with an asterisk (*) are required to complete this transaction; other fields are optional. If you do not want to provide us with the required information, please use the "Back" button on your browser to return to the previous page, or close the window or browser session that is displaying this page.

Preferred language for profiling : English

IBM has sold its PC business to Lenovo Group Ltd. To facilitate your ability to browse for information on PC products and services, your ID and password will provide you access to both the IBM and Lenovo web sites. IBM is not responsible for the privacy practices or the content of the Lenovo web site. [Learn more](#) about IBM & Lenovo.

Please submit the following information, which is required each time you sign in. Please provide an email address as your IBM ID. This can be, but need not be, the same as the email address you provide below as editable contact information.

Remember, you can't change your IBM ID once you've signed up. To learn what is acceptable as a password, see [guidelines for IBM IDs and passwords](#).

* IBM ID:

[Why do I have to provide an email address as my IBM ID?](#)

* Password:

(Minimum 8 characters)

* Verify password:

Please enter a security question that only you can answer. Then, enter the answer to the question. Occasionally, you may be asked to answer this question to confirm your identity. Enter a question that is simple to answer and is easy to remember.

* Security question:

* Answer to security question:

* Email:

Select the country of your residence to set warranty. [Learn more](#)

* Country/region of residence:

Please select country

Your preferences and interests will be associated with your identification information so we can continue to personalize your experience when you visit IBM.COM sites. If you do not want us to associate your information, please check this box.

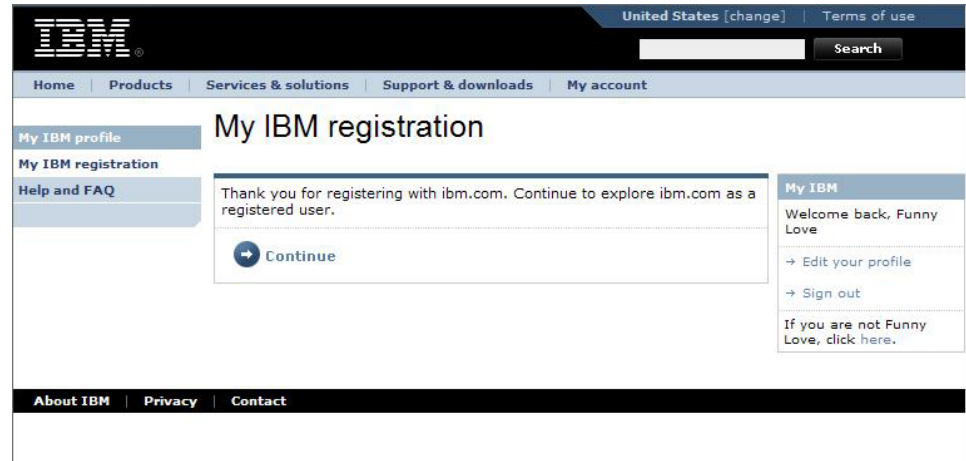
☐ Please do not associate my preference and interest with my identification information.

About IBM Privacy Contact

2. On the "My IBM Registration" page, enter the following information:
 - IBM ID, which is an email address
 - Password
 - Verification of the password
 - Security question
 - Answer to the security question
 - Email address
 - Country or region of residence

If you have problems registering on the IBM website, click **Help and FAQ** on the left navigation pane, or go to <https://www.ibm.com/account/profile/dk?page=helpdesk>.

3. Click **Continue**. The following page opens, thanking you for registering with ibm.com.



4. Click **Continue** and the Features on Demand page opens. Go to “Activating the Features on Demand feature” on page 8.

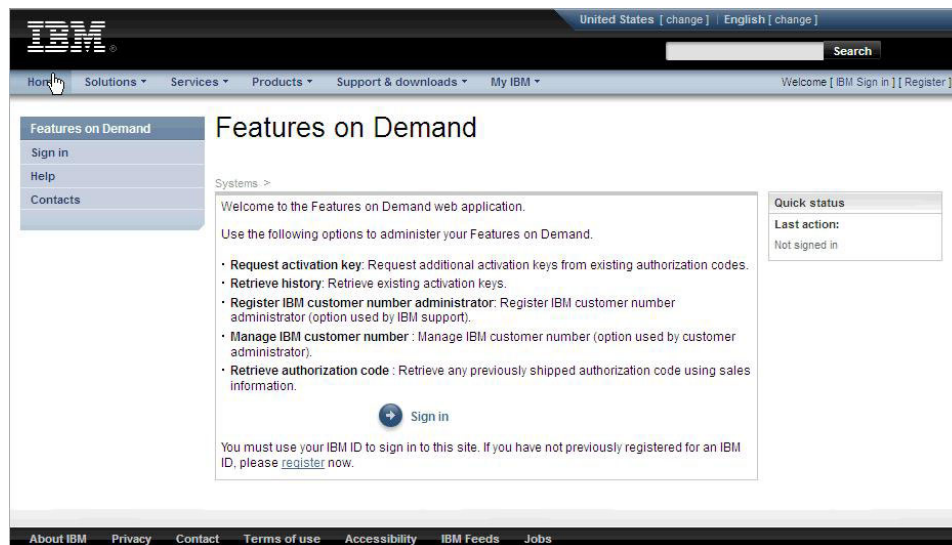
Activating the Features on Demand feature

Before you begin, make sure that the following items are available:

- Authorization code that is at the top of the *IBM Feature Activation Instructions* document that was sent to you in the mail
- Access to the hardware or software that you want to activate

To activate the Features on Demand feature, complete the following steps:

1. Go to <http://www.ibm.com/systems/x/fod/>. The Features on Demand page opens.



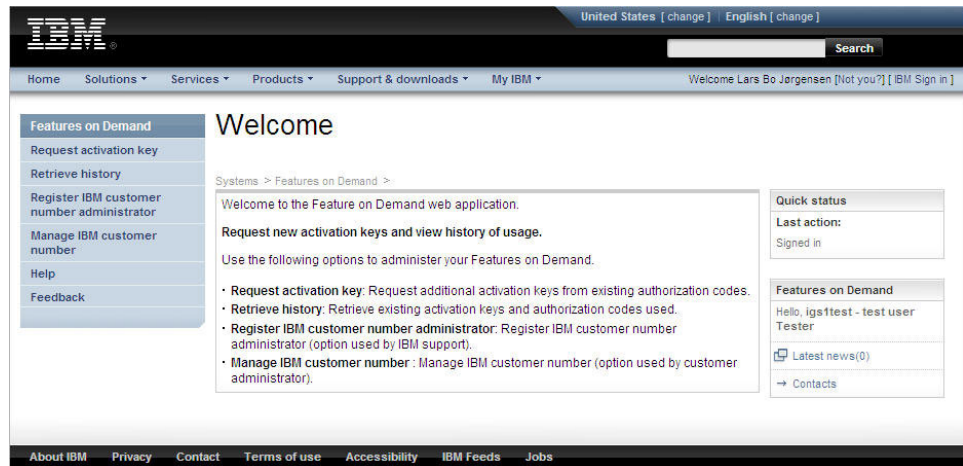
2. Click **Sign in**. The Sign in page opens.

The screenshot shows the IBM Sign in page. At the top is the IBM logo and a navigation bar with links: Home, Solutions, Services, Products, Support & downloads, and My IBM. A search bar is on the right. On the left, a sidebar contains 'My IBM registration', 'Help and FAQ', and 'Central Sign-On'. The main heading is 'Sign in'. Below it, a message asks the user to enter their IBM ID and Password. A tip suggests bookmarking the page. There are input fields for 'IBM ID:' and 'Password:', followed by a 'Submit' button. To the right, a box titled 'Additional resources' contains links: 'Forgot your IBM ID?', 'Forgot your password?', and 'Change password'. Below the sign-in form, a section for 'IBM Intranet Users' includes links for 'Login with my w3 Intranet ID' and 'Link IDs using Central Sign-On'. The footer contains links: About IBM, Privacy, Contact, Terms of use, Accessibility, IBM Feeds, and Jobs.

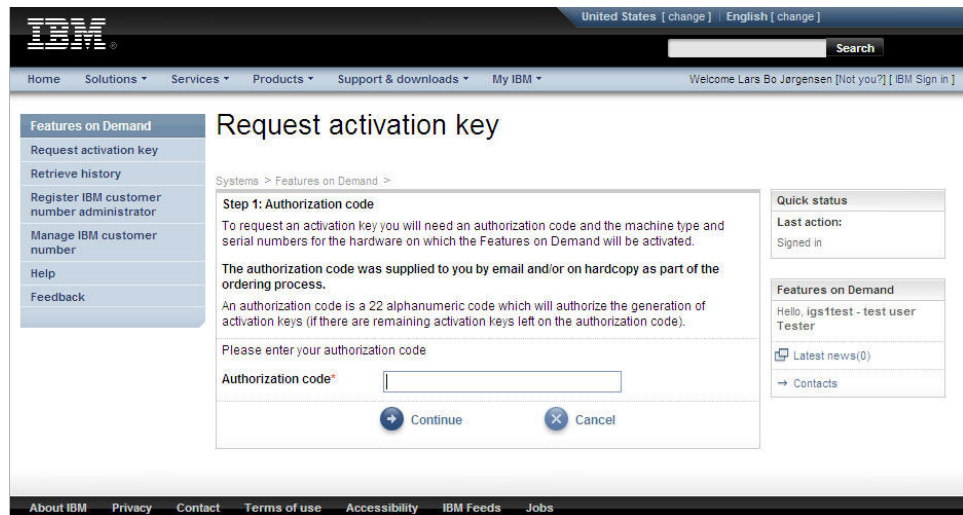
3. On the Sign in page, enter your IBM ID and password and click **Submit**. The Welcome page opens.

The screenshot shows the IBM Welcome page. The top navigation bar is the same as the previous page, but it also includes 'English [change]' and a 'Welcome Lars Bo Jorgensen [Not you?] [IBM Sign in]' link. The left sidebar now lists 'Features on Demand' with sub-links: 'Request activation key', 'Retrieve history', 'Register IBM customer number administrator', 'Manage IBM customer number', 'Help', and 'Feedback'. The main heading is 'Welcome'. Below it, a breadcrumb trail reads 'Systems > Features on Demand >'. The main content area welcomes the user to the 'Feature on Demand web application' and provides instructions on how to request new activation keys and view history of usage. It lists four options: 'Request activation key', 'Retrieve history', 'Register IBM customer number administrator', and 'Manage IBM customer number'. To the right, a 'Quick status' box shows 'Last action: Signed in'. Below that, a 'Features on Demand' box shows 'Hello, igsitestest - test user Tester', 'Latest news(0)', and a 'Contacts' link. The footer is identical to the previous page.

4. On the Welcome page, select **Request activation key** from the left navigation pane.



5. On the “Request activation key” page, enter the authorization code and click **Continue**.



6. Enter the unique identifier (UID) specified for feature activation. If you do not know the UID that is requested, see the product documentation for further information about how to retrieve and enter the identifier in the key redemption process.

Note: For server options, the UID is usually the machine type and serial number (entered together with no spaces) of the target server. For I/O modules, the UID is usually the serial number of the I/O module.

For features that include additional constraints, such as the entitlement number of chassis, an additional prompt is displayed during the authorization code redemption process. The current entitlement is displayed and you are asked for the new entitlement number. Enter the value when you are prompted. For more information about constraints, see your feature documentation.

The screenshot shows the IBM Features on Demand website. The top navigation bar includes the IBM logo, language links for 'United States' and 'English', a search bar, and a 'Welcome' message with links to 'Sign in' and 'Register'. Below this is a secondary navigation bar with links to 'Home', 'Solutions', 'Services', 'Products', 'Support & downloads', and 'My IBM'. The main content area is titled 'Request activation key' and includes a breadcrumb trail 'Systems > Features on Demand >'. The page is divided into three main sections: a left sidebar, a central form, and a right sidebar. The left sidebar, titled 'Features on Demand', contains links for 'Request activation key', 'Retrieve history', 'Register IBM customer number administrator', 'Manage IBM customer number', 'Retrieve authorization code', 'Generate report', 'Help', and 'Feedback'. The central form, titled 'Step 2: Machine details', contains the following fields: 'Feature code' (RCH1), 'Feature description' (Test feature for UUIID UID type), 'Part number / PID' (RCH0003), 'Remaining keys' (838), 'Universally Unique Identifier*' (empty), 'Constraint type' (Please select a constraint type ...), and 'Constraint value' (empty). At the bottom of the form are 'Generate key' and 'Cancel' buttons. The right sidebar contains a 'Quick status' section with 'Last action: Signed in', a 'Features on Demand' section with 'Hello,' and 'Latest news(4)', and a 'Contacts' link. The footer includes links for 'About IBM', 'Privacy', 'Contact', 'Terms of use', 'Accessibility', 'IBM Feeds', and 'Jobs', along with social media icons.

7. Select **Generate key**. A summary of what will be created is displayed. Make sure that the information is correct before you select **Confirm**.

The screenshot displays the IBM 'Request activation key' web interface. The main heading is 'Request activation key'. Below it, the breadcrumb trail is 'Systems > Features on Demand >'. The current step is 'Step 3: Machine details confirm'. A message states: 'Before request key generation, please confirm the below detail information for key generation.' The form contains the following fields:

Authorization code	DGL
Feature code	RCH1
Feature description	Test feature for UUID UID type
UID type	UniversallyUniqueIdentifier
Part number / PID	RCH0003
UID value	123321123321123321123321ABCCBAAB
Constraint type	06
Constraint value	2

At the bottom of the form are two buttons: 'Confirm' (with a plus icon) and 'Cancel' (with an X icon). The left sidebar lists various actions under 'Features on Demand', including 'Request activation key', 'Retrieve history', 'Register IBM customer number administrator', 'Manage IBM customer number', 'Retrieve authorization code', 'Generate report', 'Help', and 'Feedback'. The right sidebar shows 'Quick status' with 'Last action: Signed in' and 'Features on Demand' with 'Hello', 'Latest news(3)', and 'Contacts'.

8. Install the activation key file:
 - For a hardware target, use the IBM ToolsCenter utilities. For more information, see Chapter 3, “System feature activation,” on page 19 and the product-specific documentation for the feature that you are activating.

Keys can also be installed directly through the local product interfaces on the IMM2 and supported non-server hardware devices, such as I/O modules. For more information about supported direct-installation interfaces, see the hardware product documentation.
 - For a software target, use the method that is specified in the software target documentation. For more information, see the product-specific documentation for the feature that you are activating.

Notes:

- a. A restart of the hardware or software system might be required to complete the activation process. For more information about the activation process requirements after the key is installed, see the product documentation for the feature that you are activating.
- b. You can also use the IBM ToolsCenter utilities to activate a Features on Demand feature. For more information, see “Using IBM ToolsCenter utilities to manage Features on Demand activation keys” on page 25.

Retrieving history

On the “Retrieve history” page, you can use the authorization code or the unique identifier (UID) to search for activation key history. The results from a search using the authorization code lists all activation keys that are generated for the authorization code. The results from a search using the UID lists all activation keys that are generated for the UID.

To retrieve the history, complete the following steps:

1. Select **Retrieve history** from the left navigation pane.

The screenshot shows the IBM Features on Demand website. The left navigation pane has 'Retrieve history' selected. The main content area is titled 'Retrieve history' and shows 'Step 1: Search'. It instructs the user to use an authorization code or unique identifier (UID) to search for activation key history. There are two input fields: 'Authorization code' and 'Or uid'. Below the 'Or uid' field is a 'Continue' button and a 'Cancel' button. The right sidebar shows 'Quick status' (Signed in) and 'Features on Demand' (Hello, Latest news(0), Contacts).

2. Enter either the authorization code or the UID. Click **Continue**.

The screenshot shows the 'Retrieve history' page at 'Step 2: Result'. It displays the activation keys generated for the authorization code entered. The user's registered email address is 'R@dk.ibm.com'. Below this, it shows 'Generated keys for feature code: 0000 - IBM' and 'Total keys: 99 Unused keys: 98 Part number: PARTN01'. A table lists the machine types and serial numbers. At the bottom, there are 'Email', 'Download', and 'Cancel' buttons.

Machine type	Machine serial number	Machine type description
<input type="checkbox"/> 1936	10AABBC	1936 - IBM BladeCenter
<input type="checkbox"/> Select all		

3. Select the device for which you want to retrieve the key (as shown in the previous illustration). To send the key information to the email address of the user who is logged in, click **Email**. To download the activation key directly to your computer, click **Download**.

Managing the IBM customer number

On the “Manage IBM customer number” page, you can see a list of the customer numbers for which you have administrative authority and any users who are registered for the customer number. You can add or remove users as administrators for a customer number.

Note: If you cannot select a customer number in the **Customer number** field, click **Contacts** in the right navigation pane to contact customer support for your region.

To manage the IBM customer number, complete the following steps:

1. Select **Manage IBM customer number** from the left navigation pane.

IBM United States [change] English [change]

Home Solutions Services Products Support & downloads My IBM Welcome [IBM Sign in] [Register]

Manage IBM customer number

Systems > Features on Demand >

Manage IBM customer number

This page lists the customer numbers to which you have administrative authority and any users registered for the customer number. You may add or remove additional users as administrators for a customer number.

Note: If a customer number is not selectable in the table below, you may contact Customer Support for assistance. Please use the 'Contacts' link in the right-hand menu to find support for your region.

Identification

Customer number* Please select a customer number +

Cancel

Quick status

Last action: Customer number registered

Features on Demand

Hello,

Latest news(0)

→ Contacts

About IBM Privacy Contact Terms of use Accessibility IBM Feeds Jobs

2. Select a customer number to which your IBM user ID is linked and click the arrow.

IBM United States [change] English [change]

Home Solutions Services Products Support & downloads My IBM Welcome [IBM Sign in] [Register]

Manage IBM customer number

Systems > Features on Demand >

Manage IBM customer number

This page lists the customer numbers to which you have administrative authority and any users registered for the customer number. You may add or remove additional users as administrators for a customer number.

Note: If a customer number is not selectable in the table below, you may contact Customer Support for assistance. Please use the 'Contacts' link in the right-hand menu to find support for your region.

Identification

Customer number* 8921234567 +

Customer name

Registered users

Userid	Username	User email
igs1test	igs1test - test user Tester	@dk.ibm.com

Remove

Add IBM user ID Add user

Confirm Cancel

Quick status

Last action: Customer number registered

Features on Demand

Hello,

Latest news(0)

→ Contacts

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3. To link additional users to your customer number, complete the following steps.

Note: Each user must have an IBM user ID and must have signed on at least once on the IBM Features on Demand website.

- a. In the **Add IBM user ID** field, enter the IBM user ID.
- b. Click **Add user**. The user ID, user name, and user email address are displayed.
- c. Click **Confirm**.

The screenshot shows the IBM Features on Demand website interface. The top navigation bar includes the IBM logo, language options (United States, English), a search bar, and links for Home, Solutions, Services, Products, Support & downloads, and My IBM. A welcome message and links for Sign in and Register are also present.

The main content area is titled 'Manage IBM customer number'. It includes a sidebar with links for Request activation key, Retrieve history, Register IBM customer number administrator, Manage IBM customer number, Retrieve Authorization Code, Help, and Feedback.

The main content area displays a success message: 'Customer number 8921234567 registered successfully. You may continue registering customer number using this page.' Below this, there is a section titled 'Manage IBM customer number' with a description: 'This page lists the customer numbers to which you have administrative authority and any users registered for the customer number. You may add or remove additional users as administrators for a customer number.' A note states: 'Note: If a customer number is not selectable in the table below, you may contact Customer Support for assistance. Please use the 'Contacts' link in the right-hand menu to find support four your region.'

The 'Identification' section contains a table with the following columns: Customer number, Name, and Action. The table is currently empty. A 'Cancel' button is located at the bottom of the table.

The right-hand sidebar contains a 'Quick status' section with 'Last action: Customer number registered', a 'Features on Demand' section with 'Hello,' and 'Latest news(0)', and a 'Contacts' link.

All users who are linked to a customer number will receive authorization codes through email for future orders that are placed. However, authorization codes for some software-based Features on Demand features are only delivered by mail.

Retrieving an authorization code

On the “Retrieve Authorization Code” page, you can request to have a PDF file with an authorization code emailed to you.

To retrieve an authorization code, complete the following steps:

1. Select **Retrieve Authorization Code** from the left navigation pane.

The screenshot shows the IBM website interface for retrieving an authorization code. The left navigation pane includes links for 'Request activation key', 'Retrieve history', 'Register IBM customer number administrator', 'Manage IBM customer number', 'Retrieve authorization code', 'Generate report', 'Help', and 'Feedback'. The main content area is titled 'Retrieve authorization code' and contains the following text:

For authorization code retrieval fill out the below mandatory fields and submit the request.

The application will provide the authorization code by emailing a PDF file if a matching record is found.

The fields indicated with an asterisk (*) are required to complete this transaction. If you do not want to provide the information use the Cancel button on your browser to return to the previous page, or close the window or browser session that is displaying this page.

Order number can be one of:

- Plant order number(6 characters) - Can retrieve a single authorization code
- Sales order number(10 characters) - Can retrieve all the authorization codes on a sales

Order P/N is mandatory when retrieving authorization codes for hardware Features on Demand. When retrieving authorization codes for software Features on Demand, leave Order P/N blank.

Note: To ensure that you continue to receive future correspondence without issues, please add R17ACKNOWLEDGEMENTS@dk.ibm.com as an exception to your spam filter.

Identification

Customer number *

Order number *

Order P/N

Your Email address

Other recipients(cc:)

Note: By clicking **Submit** you agree that IBM may process and retain your data for the purposes listed above in accordance with IBM's data privacy policy.

The right sidebar shows 'Quick status' with 'Last action: Signed in' and 'Features on Demand' with 'Hello', 'Latest news(4)', and 'Contacts'.

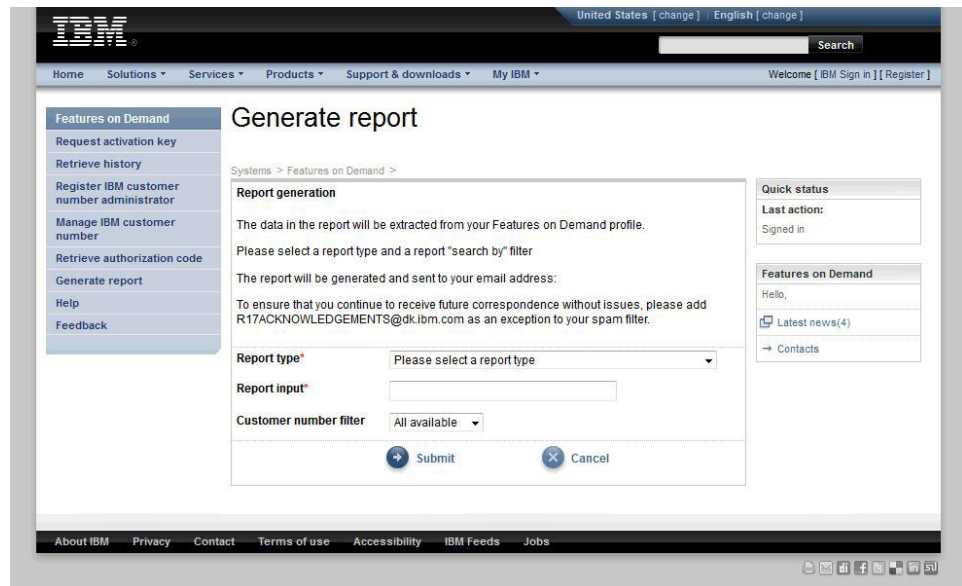
2. Enter the customer number with country code, plant order number, and order part number or product ID. These numbers are on the packing list that comes with your order. The **Your Email address** field is automatically populated with the user email address. In the **Other recipients** field, separate email addresses with commas.
3. Click **Submit**. A confirmation window is displayed.

Generating a report

On the “Generate report” page, you can create several report types based on specified criteria and entered information. A comma separated value (.csv) document with the results is emailed to you.

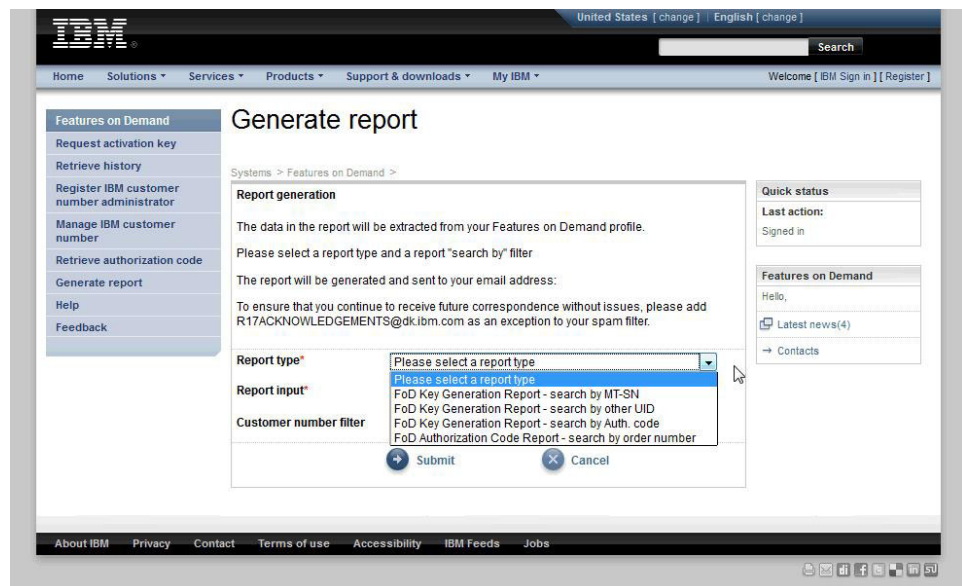
To generate a report, complete the following steps:

1. Select **Generate report** from the left navigation pane.



2. Select a report type in the **Report type** field. You can generate reports based on searches of the following information:

- Machine type and serial number
- Other UID
- Authorization code
- Order number



- Based on the selected report type, enter an applicable value in the **Report input** field. An example is shown in the following window.

The screenshot shows the IBM 'Generate report' page. The left sidebar contains a 'Features on Demand' menu with options: Request activation key, Retrieve history, Register IBM customer number administrator, Manage IBM customer number, Retrieve authorization code, Generate report, Help, and Feedback. The main content area is titled 'Generate report' and includes a breadcrumb 'Systems > Features on Demand >'. Below this, the 'Report generation' section explains that data will be extracted from the user's profile and that a report type and search filter must be selected. It also provides an email address for correspondence: R17ACKNOWLEDGEMENTS@dk.ibm.com. The form fields are: 'Report type' (dropdown menu showing 'FoD Key Generation Report - search by MT-SN'), 'Report input' (text box containing '7955AAAAAA'), and 'Customer number filter' (dropdown menu showing 'All available'). There are 'Submit' and 'Cancel' buttons at the bottom. On the right, a 'Quick status' box shows 'Last action: Report submitted', and a 'Features on Demand' box shows 'Hello,' and 'Latest news(3)'.

- You can refine the result by selecting a customer number for which you are an administrator. Select the customer number in the **Customer number filter** field.
- Click **Submit**. A confirmation window is displayed. You will receive an email with the report attached. There is no attachment if the result is empty.

The screenshot shows the same IBM 'Generate report' page, but now with a confirmation message. The 'Report generation' section displays a blue information icon and the text: 'The report has been submitted. Thank you for your request. The report has been submitted for processing. You can continue to generate report by selecting another report type or report input or customer number. Once the report is completed it will be sent to:'. The form fields and buttons remain the same as in the previous screenshot.

Chapter 3. System feature activation

The administration of a Features on Demand activation key is different depending on the type of feature that you install:

- Server-based Features on Demand

The server Integrated Management Module II (IMM2) is the point of administration for Features on Demand activation keys. If the server supports a web interface into the IMM2, you can administer activation keys with a web browser connection. For more information about the IMM2 web interface, see the *IMM2 User's Guide*.

- Software-based Features on Demand

The software package configuration interface is the point of administration for Features on Demand activation keys.

- Switches and I/O module Features on Demand

The management interface of the device is the point of administration for Features on Demand activation keys.

- Chassis-based Features on Demand

The management module of the chassis is the point of administration for Features on Demand activation keys.

For each device type, device-applicable standard protocols are supported, according to the following information:

- Simple Network Management Protocol (SNMP) is supported through a Features on Demand management information base (MIB) on I/O modules, network switches, and the IMM2 devices that support the Features on Demand feature. For details about the Features on Demand MIB, see Appendix A, “Features on Demand MIB,” on page 49.
- A web interface or command line interface (CLI) is supported on a device-by-device basis. Where applicable and aligned with the device operational semantics, support for administering Features on Demand activation keys is available through the native command line or web interface of the Features on Demand-compliant device.

Note: These interfaces are not standard and are not universally available across all Features on Demand-compliant implementations. For more information about how web and CLI interfaces operate and whether they support feature key administration, see the device-specific documentation.

Manually installing a Features on Demand activation key on the IMM2

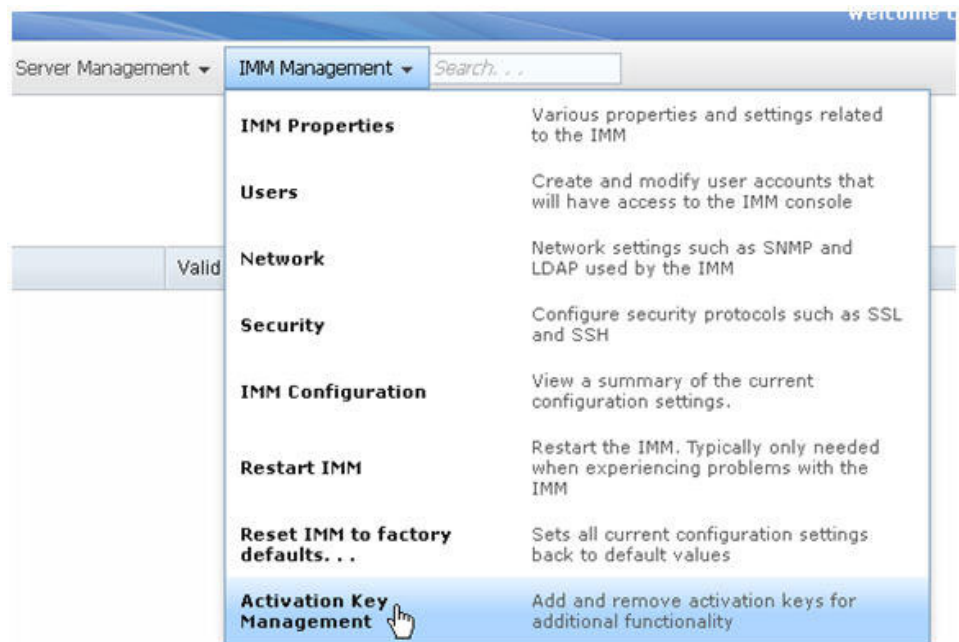
For a Features on Demand activation key that is stored in the IMM2, you can use the IMM2 web interface to manually install the Features on Demand activation key to activate the feature that you purchased. You can also use the IMM2 CLI `keycfg` command to display, add, or delete Features on Demand activation keys. For details and syntax of the `keycfg` command, see the IMM2 *User's Guide* at <http://www-947.ibm.com/support/entry/portal/docdisplay?Indocid=MIGR-5086346>.

Before you install an activation key, you must have the Features on Demand activation key on your system or removable media. That is, you must have ordered a Features on Demand option and received the authorization code through the mail or email and per the instructions in Chapter 2, "Using the IBM Features on Demand website," on page 5, you must have received the key from KMS. The IMM2 web interface on the target server is accessed by using a remote interface from a workstation over the network. If you need more information about the remote access, see the IMM2 *User's Guide*.

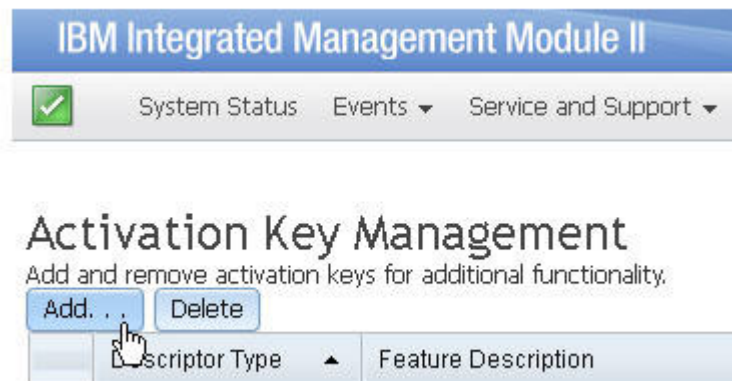
To manually install a Features on Demand by using the IMM2 web interface, complete the following steps:

1. Open a web browser. In the address or URL field, type the IP address or host name of the IMM2 server to which you want to connect.
2. Type your user name and password in the IMM2 Login window.
3. Click **Log In** to start the session.

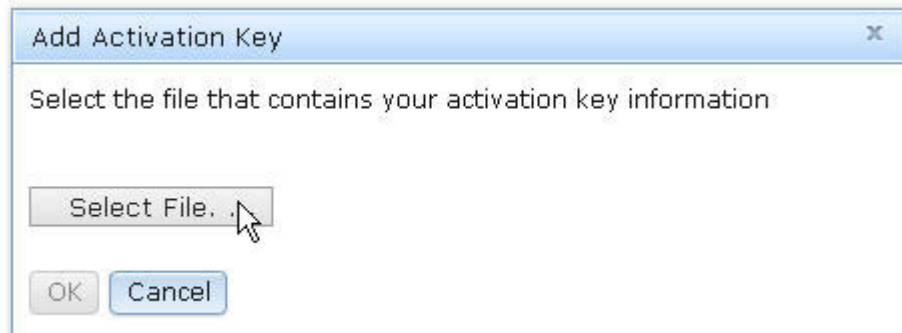
- From the IMM2 web interface, click on the **IMM Management** tab; then click on **Activation Key Management**.



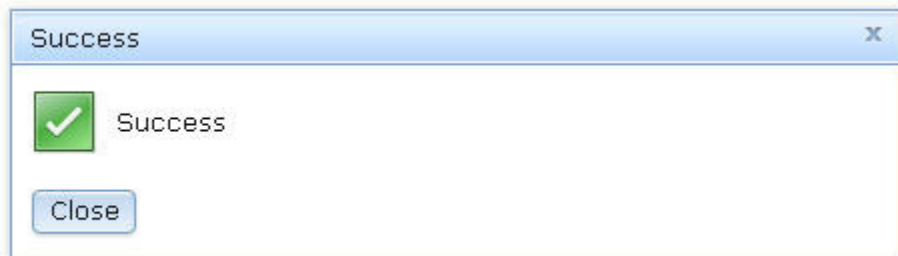
- From the Activation Key Management page, click **Add**.



6. In the Add Activation Key window, click **Select File**; then, select the activation key file to add in the File Upload window and click **Open** to add the file or click **Cancel** to stop the installation. To finish adding the key, click **OK**, in the Add Activation Key window, or click **Cancel** to stop the installation.

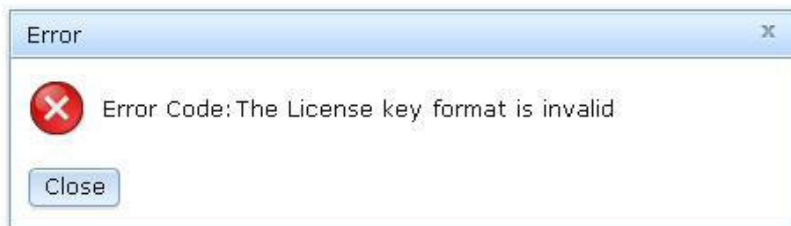


The Success window indicates that the activation key is installed correctly.

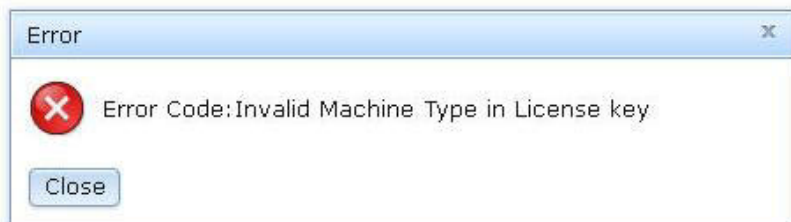


Notes:

- If the activation key is not valid, the following error window is displayed.



- If you are attempting to install the activation key on a machine type that does not support the Features on Demand feature, the following error window is displayed.



7. Click **OK** to close the Success window.

The selected activation key is added to the server and is displayed on the Activation Key Management page.

Note: You might have to restart your system to complete the installation of the activation key.

Activation Key Management
Add and remove activation keys for additional functionality.

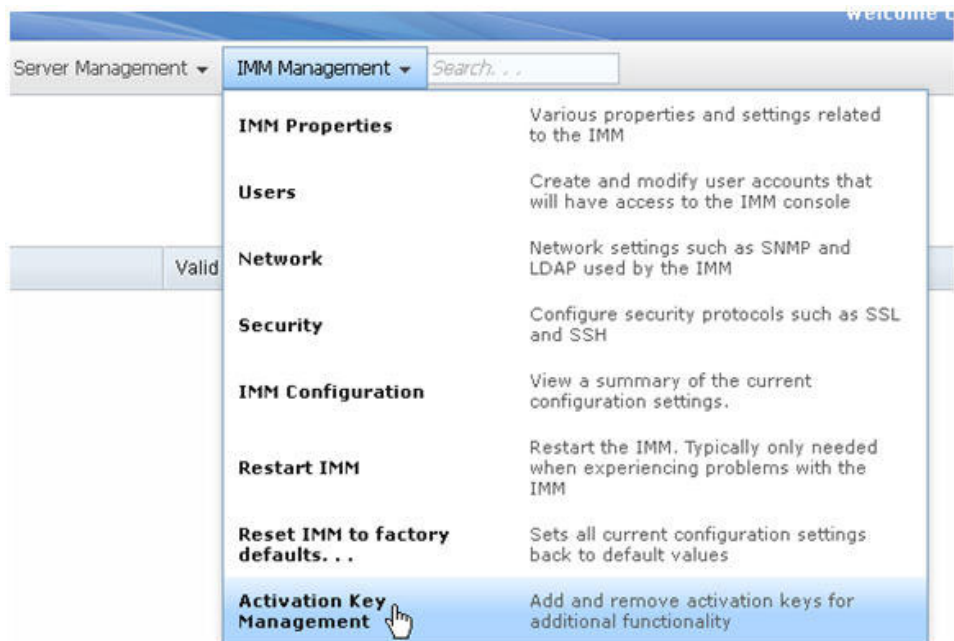
Add... Delete

Descriptor Type	Feature Description	Valid Through	Uses Remaining	Status
32781	LSI CCoH Enablement	No Constraints	No Constraints	Activation key is valid

Manually removing a Features on Demand activation key on the IMM2

To remove a Features on Demand activation key, complete the following steps:

1. Open a web browser. In the address or URL field, type the IP address or host name of the IMM2 server to which you want to connect.
2. Type your user name and password in the IMM2 Login window.
3. Click **Log In** to start the session.
4. From the IMM2 web interface, click on the **IMM Management** tab; then click on **Activation Key Management**.



5. From the Activation Key Management page, select the activation key to remove; then, click **Delete**.

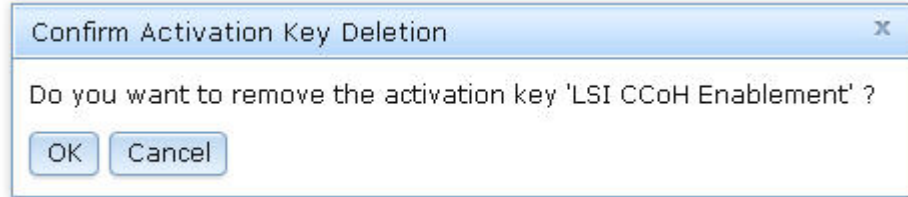
Activation Key Management

Add and remove activation keys for additional functionality.

Add... Delete

Descriptor Type	Feature Description	Valid Through
32781	LSI CCoH Enablement	No Constraints

6. In the Confirm Activation Key Deletion window, click **OK** to confirm activation key deletion or click **Cancel** to keep the key file.



The selected activation key is removed from the server and is no longer displayed on the Activation Key Management page.

Note: You might have to restart your system to complete the removal of the activation key.



Using IBM ToolsCenter utilities to manage Features on Demand activation keys

IBM ToolsCenter V9.00 provides the following two utilities to help you manage Features on Demand activation keys:

- Advanced Settings Utility (ASU)
- Dynamic System Analysis (DSA)

Using the IBM Advanced Settings Utility

The IBM Advanced Settings Utility (ASU) is a command line utility that enables you to manage keys. The ASU is supported on Windows and Linux operating system clients and is designed to automate the process of managing Features on Demand keys. The ASU commands enable you to manage activation keys for all Features on Demand features: server-based, software-based, switches, I/O modules, and chassis-based features.

The ASU commands support the following functions:

- Install a key. Use the ASU **installkey** command to install an activation key. You can also use the ASU to acquire the activation from the Features on Demand website (KMS) and install the key to activate your Features on Demand feature. To utilize this function, you must have the feature authorization code and have network connectivity to <http://www.ibm.com/>.
- Remove (or uninstall) a key. Use the ASU **uninstallkey** command to uninstall or deactivate a feature key.
- Export a key. Use the ASU **exportkey** command to export an activation key from the IMM2 on which it is installed if you must back up the server, or if you are instructed to export the key before you replace the server system board.
- Inventory keys. Use the ASU **reportkey** command to retrieve inventory information and activation status for the Features on Demand features. The **reportkey** command generates a list of all keys that are installed on the system and gives their descriptions.

For more information about using the ASU to manage Features on Demand activation keys, including complete syntax instructions, see <http://www-947.ibm.com/support/entry/portal/docdisplay?Indocid=MIGR-5085890> and the ToolsCenter for System x and BladeCenter information center documentation at http://publib.boulder.ibm.com/infocenter/toolsctr/v1r0/topic/toolsctr/asu_main.html.

Using IBM Dynamic System Analysis

IBM Dynamic System Analysis (DSA) collects and analyzes system information to aid in diagnosing problems. DSA has two utilities, Preboot DSA and Portable DSA, that you can use for Features on Demand key management functions, including online and offline key installation, key removal, Features on Demand key inventory reporting, and exporting Features on Demand information.

For more information and instructions for using DSA to manage Features on Demand activation keys, see <http://www-947.ibm.com/support/entry/portal/docdisplay?Indocid=MIGR-5084901>, http://publib.boulder.ibm.com/infocenter/toolsctr/v1r0/topic/dsa/dsa_main.html, and the ToolsCenter for System x and BladeCenter information center documentation at http://publib.boulder.ibm.com/infocenter/toolsctr/v1r0/topic/toolsctr/asu_main.html.

Portable DSA

Portable DSA is a command line utility that requires that the operating system is running. The following Features on Demand key management functions are provided by the Portable DSA utility:

- Reporting the available Features on Demand keys for a target device. (IMM, management module of the chassis, or switch)
- Acquiring and downloading activation keys from an IBM website (KMS). This task requires a network connection to <http://www.ibm.com/> (IMM, management module of the chassis, or switch)
- Installing activation keys from key files on a user-specified location to a target device. (IMM, management module of the chassis, or switch)
- Exporting the local Features on Demand unique IDs to a file saved in the DSA output path. (IMM only)
- Uninstalling activation keys from a target device or switch (IMM or management module of the chassis)

Note: Before you install or uninstall a Features on Demand activation key on the management module of the chassis, switch, or remote IMM2, make sure that there is a LAN connection available.

Preboot DSA

Preboot DSA is used on a basic system without the operating system enabled and consists of a GUI interface and command-line interface (CLI). Through the Preboot DSA GUIs or CLI, you can manage features for server-based, chassis-based, and switch Features on Demand features.

If an Internet connection is not available, the Preboot DSA GUIs or CLI enable you to perform the following functions:

- Display the Features on Demand features installed on your device and also display the other available Features on Demand features for purchase.
- Install activation keys from removable media.
- Uninstall activation keys
- Export activation keys or removable media for backup or before a repair is performed, for example, a planar replacement.

If an Internet connection is available, the Preboot DSA GUIs or CLI enable you to perform the following functions:

- Display the Features on Demand features that are installed on your device and also display the other available Features on Demand features for purchase.
- Install activation keys directly on the KMS website.

Note: If a key is available for the Features on Demand feature that has been generated previously, no authorization code is needed for the installation. If a key is not available for the Features on Demand feature, an authorization code is needed for key generation.

- Install activation keys from removable media
- Uninstall activation keys
- Export activation keys or removable media for backup or before a repair is performed, for example, a planar replacement

Using IBM Systems Director to manage Features on Demand activation keys

You can use the Feature Activation Manager configuration settings in IBM Systems Director to manage Features on Demand activation keys on Integrated Management Module II (IMM2), Chassis Management Module (CMM), or switches that support Features on Demand.

The Feature Activation Manager configuration settings enable you to perform the following tasks:

- Obtain activation keys by using the Key Management System (KMS)
- Upload activation keys from a local directory
- Choose whether you want to reboot a device automatically after an activation key is installed to complete the activation
- Install activation keys on the target device
- Retrieve activation keys from the target device and show the detail license information
- Remove and deactivate existing keys from the target device

You can also create a Feature Activation Manager template through the IBM Systems Director configuration manager and use the template for the entire configuration across a group of like devices.

For more information and for instructions for how to use configuration manager and Feature Activation Manager, see http://publib.boulder.ibm.com/infocenter/director/pubs/index.jsp?topic=%2Fcom.ibm.director.configuration.helps.doc%2Ffqm0_t_cm_configuring_resources.html.

You can also access Feature Activation Manager from the Resource Explorer, System Configuration link on the IBM Systems Director console or from the IBM Flex System™ Manager user interface.

Prerequisite tasks before using IBM Systems Director Feature Activation Manager

This section describes the tasks that you must perform before using IBM Systems Director Feature Activation Manager on a system or switch.

For supported systems

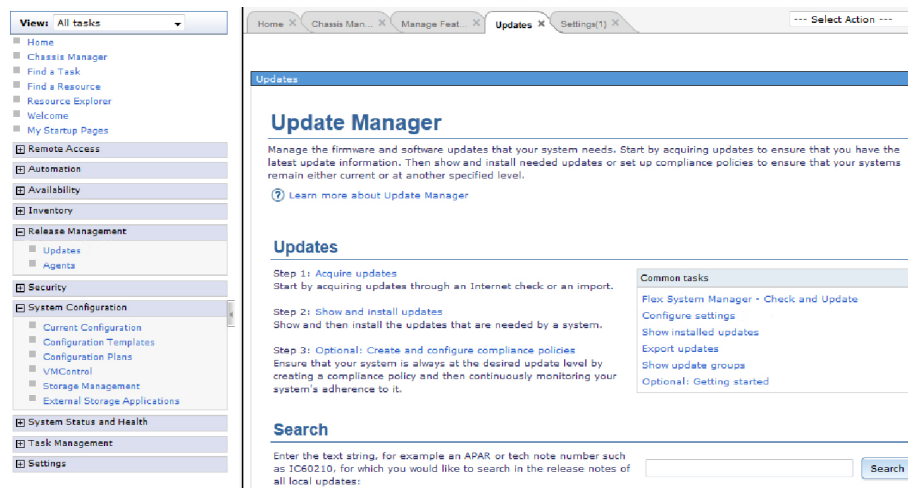
You must perform the following tasks before you retrieve or install Features on Demand activation keys on supported systems:

- Use the system discovery task to discover the system on which you want to retrieve or install Features on Demand activation keys:
 - Directly discover IMMv2 devices or switches (standalone mode)
 - Directly discover CMM (compute nodes and switches on the chassis are discovered after the CMM is unlocked)
- Use the configure access task to unlock the system credentials information, which provides privileges to manage Features on Demand keys.

For switches

You must perform the following tasks before you install or add feature activation keys to a switch:

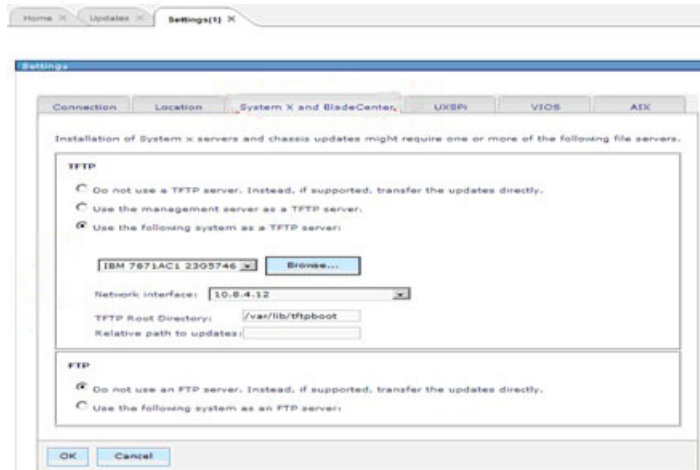
1. To configure the Trivial File Transfer Protocol (TFTP) server settings for the switch, complete the following steps. The TFTP server is used to inventory or install feature activation keys on the switch.
 - a. From the left navigation pane, under **Release Management**, select **Updates**.
 - b. On the **Updates** tab, select **Configure settings** under **Common tasks**.



- c. On the Settings page, select **System x** and **BladeCenter**.

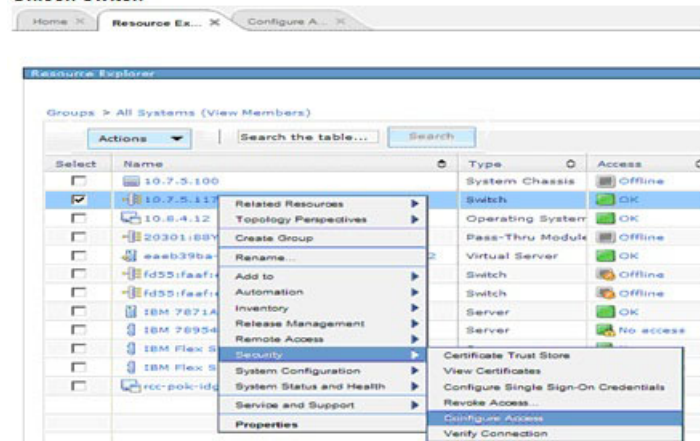
- d. Select one of the following options:
 - Select **Use the management server as a TFTP server** to use the TFTP server that is embedded within the management server.
 - Select **Use the following system as a TFTP server** to specify an external TFTP server.

Note: For IBM Flex System environments, you must use an external TFTP server.



2. To enable either SNMPv1v2c or create an SNMPv3 user with privilege to manage key in the switch, complete the following steps:
 - a. Select the **Resources Explorer** tab and on the Resources Explorer page, select the switch.
 - b. Right-click on the switch and click **Security -> Configure Access**.

Unlock Switch



- c. When the Configure Access page is displayed, click the SNMP access type.

Access to the identified system for all authorized Systems Director users is specified below in the Access field. The table contains an access state of the individual access points that are used to evaluate the overall status.

Select Request Access to enter a user ID and password to gain access to the identified system. Select Revoke Access to remove aut

System: 10.7.5.117

Access: ☒ OK

For basic system management function, a remote system credential is needed to grant all authorized Systems Director users access Type link to view the list of manageable credentials configured for authentication on the selected access point. Certain types of acc or configurable. Some examples include CAS and IPC credentials.

10.7.5.117 (Remote Service Access Point)

Select	Access Type	Access State	Trust State	Access Information	Port
<input type="checkbox"/>	HTTP	Not applicable	Not applicable	http://10.7.5.117:80	
<input type="checkbox"/>	HTTPS	OK	Not applicable	https://10.7.5.117:443	
<input type="checkbox"/>	SNMP	OK	Not applicable	snmp://10.7.5.117:161	
<input type="checkbox"/>	SSH	OK	Not applicable	sah://10.7.5.117:22	

- d. The information is updated and the SNMP name and type are displayed. Select the SNMP name and click **Edit** to configure the Write Community String for SNMP v1v2c or configure the SNMP v3 credentials information for the switch.

Access to the identified system for all authorized Systems Director users is specified below in the Access field. The table contain access state of the individual access points that are used to evaluate the overall status.

Select Request Access to enter a user ID and password to gain access to the identified system. Select Revoke Access to remov

System: 10.7.5.117

Access: ☒ OK

For basic system management function, a remote system credential is needed to grant all authorized Systems Director users a Type link to view the list of manageable credentials configured for authentication on the selected access point. Certain types of or configurable. Some examples include CAS and IPC credentials.

10.7.5.117 > SNMP (Credential)

Select	Name	Type
<input type="checkbox"/>	foo	SNMP v3
<input type="checkbox"/>	public	SNMP v1/v2c

Consider the following best practices before you retrieve or install Features on Demand activation keys for a switch:

- When you add or remove feature activation keys for a switch, determine whether the keys must be installed or removed in a specific order. For more information, see the documentation that comes with the switch.
- You can enable or disable the configuration manager log files to capture messages if a problem occurs when you retrieve or install a Features on Demand activation key. Use the following commands:
 - Enabled logs:


```
smcli cmserverlogstart
smcli cmconsolelogstart
```
 - Disabled logs:

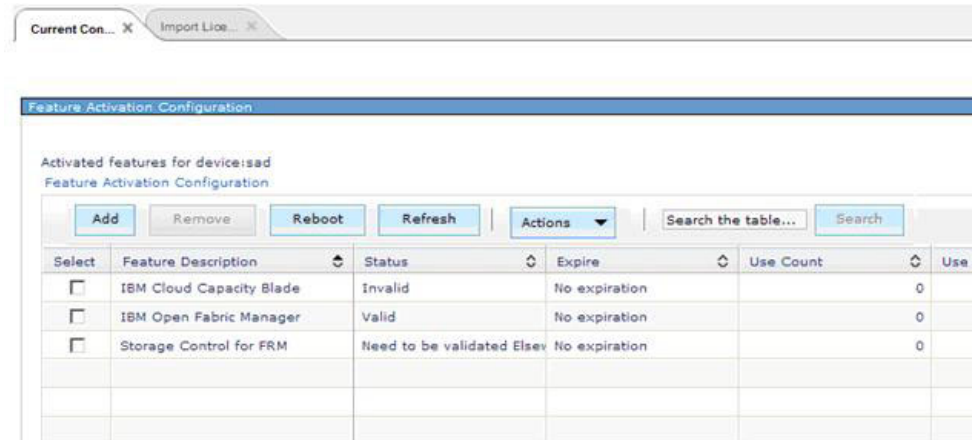

```
smcli cmserverlogstop
smcli cmconsolelogstop
```
 - Location of the logs:


```
%Director%/log/configmgr/ directory
```

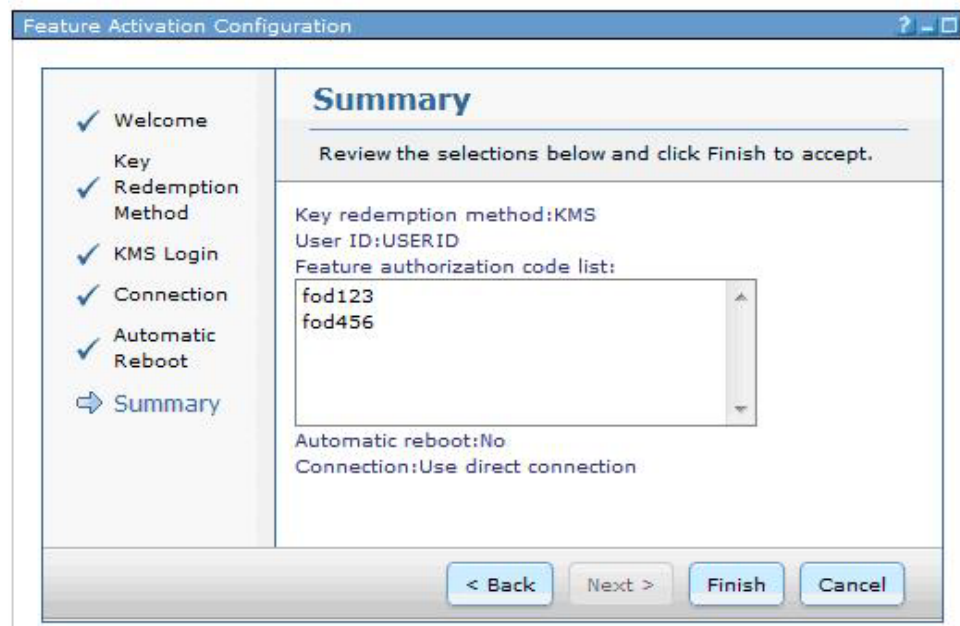
Using IBM Systems Director Feature Activation Manager

IBM Systems Director Feature Activation Manager provides two user interfaces that you can use to manage Features on Demand activation keys:

- **Feature Activation Configuration page:** On this page you can view information about installed feature activation keys, add and remove keys, and reboot the specified device on which a feature activation key is installed or removed.



- **Feature Activation Configuration wizard:** You can use the wizard to obtain or upload activation keys and install and activate keys.



Starting the Feature Activation Manager user interface from IBM Systems Director

You can start the Feature Activation Manager user interface in two different modes:

- **Retrieves Configuration:** You can access the installed feature activation key information, add a new key, and remove existing keys on the target device.
- **Create Template:** You can create a new Feature Activation Manager template and use it to deploy to one or more target devices.

Retrieving a Features on Demand activation key

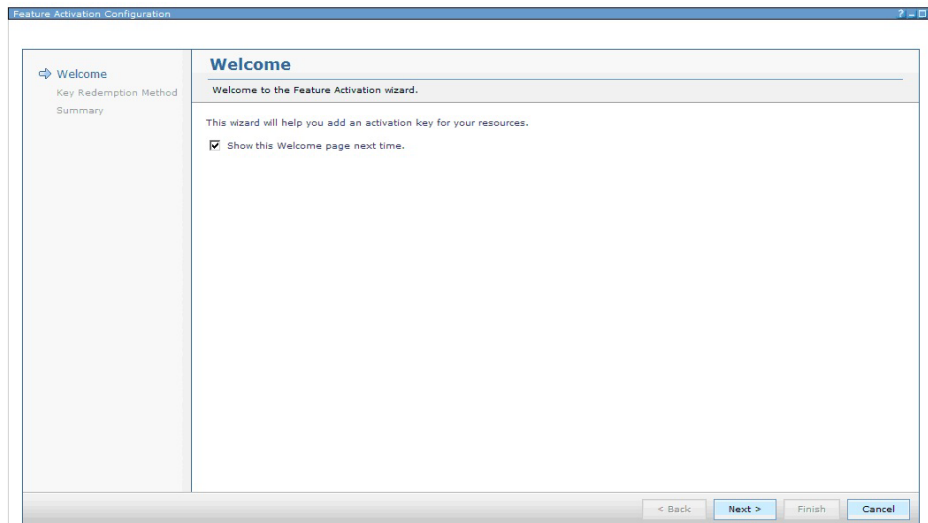
To retrieve a Features on Demand activation key, complete the following steps:

1. From **Resource Explorer**, expand All Systems and select one of the following systems:
 - System x server that is managed by IMM2
 - IBM Flex System Enterprise Chassis that is managed by CMM
 - Network system that is managed by a switch
2. You can get the real time configuration on feature activation keys of the selected system in three ways:
 - Click the system name to open its properties window and select the **Configuration** tab, then select **Feature Activation Manager Configuration setting** and click **Edit**.
 - Right-click the system name and select **System Configuration -> Current configuration task**, then select **Feature Activation Manager Configuration setting**, and click **Edit**.
 - Right-click the system name and select **System Configuration -> Configuration Settings -> configuration task -> Feature Activation Manager Configuration task**.
3. The Feature Activation Configuration page opens. On this page you can view information about the installed feature activation keys and perform the following actions:
 - Click **Add Keys** to start the Feature Activation Configuration wizard and add one or more feature activation keys.
 - Click **Remove** to remove the selected feature activation key.
 - Click **Reboot** to restart the specified device on which a feature activation key is installed.
 - Click **Refresh** to refresh the Feature Activation Configuration table.

Creating a Feature Activation Manager template

To create a Feature Activation Manager template, complete the following steps:

1. Under **System Configuration** on left navigation pane, select **Configuration Templates**. You can create, create like, edit, delete, or deploy Feature Activation Manager templates from this table.
2. Select **Create** to create a new Feature Activation Manager template.
3. Select **template type** to select the type of system on which a configuration template is deployed. You can have one of the following target types:
 - IBM Flex System Enterprise Chassis
 - Ethernet switch
 - InfiniBand switch
 - Server (through the CIM protocol)
4. Select **Feature Activation Manager Configuration** to create a template.
5. Enter the template name and template description and then click **Continue**. The Feature Activation Configuration wizard opens. Use the following information to configure the Features on Demand keys:
 - Welcome page. You can choose to not see this page next time.



- Key Redemption Method page. On this page you can specify one of the following methods to use to obtain the activation keys that you want to configure:
 - **Obtain activation keys from Key Management System (KMS):** Requires that you log in to KMS and specify one or more feature authorization codes. Purchasing a feature activation for an IBM resource or software application might include the feature authorization code, or you might generate and download the feature authorization code. The feature authorization code is an 22-character string that is correlated with a specific feature activation.
 - **Upload activation keys from a local system:** Requires that you specify one or more local activation key files. Purchasing a feature activation for an IBM resource or software application might entitle you to a key file to activate the feature. The key file might be preinstalled on a resource, the key file might be sent to you, or you might have to generate the key file. To activate a feature by uploading a key file, you must know the location of the file.

The screenshot shows a window titled "Feature Activation Configuration". On the left is a sidebar with a tree view containing "Welcome", "Key", "Redemption Method" (which is selected and highlighted), and "Summary". The main area of the window is titled "Key Redemption Method" and contains the text: "The key files to be used for key activation can be redeemed from Key Management System (KMS), or uploaded from a local directory." Below this text are two radio button options: "Obtain activation keys from Key Management System (KMS)" (which is selected) and "Upload activation keys from a local system". At the bottom right of the window are four buttons: "< Back", "Next >", "Finish", and "Cancel".

- Upload Key Files page. This page displays only if you choose to upload activation keys from a local system. Select one or more key files that you want to use to activate the associated feature. Click **Browse** to locate and specify the file that you want to use, and then click **Add to List** to add the file to the Key file list. You can select and add only one file at a time.

To remove a file from the list, select the file that you want to remove and click **Remove**.

The screenshot shows a window titled "Feature Activation Configuration" with a sidebar on the left and a main content area. The sidebar contains a list of steps: "Welcome", "Key Redemption Method", "Upload Key Files" (which is highlighted with a blue arrow), "Automatic Reboot", and "Summary". The main content area has a header "Upload Key Files" and a sub-header "The key files to be used for key activation can be uploaded from a local directory. Add one or more key files to the list." Below this, there is a text prompt "To import a file, click Browse to select a file." followed by a text input field and a "Browse..." button. Below that is an "Add to List" button. Further down is a section labeled "*Key file list:" followed by a large empty rectangular box and a "Remove" button. At the bottom left of the main area, there is a note "* Required field". At the bottom of the window, there are four buttons: "< Back", "Next >", "Finish", and "Cancel".

- **KMS Login page.** This page displays only if you choose to obtain activation keys from Key Management System (KMS). Specify the user ID and password that is required to log in to KMS, and then specify at least one feature authorization code.

In the **Feature authorization code** field, type the authorization code to use, and then click **Add to list** to add the code to the Feature authorization code list.

To remove a feature authorization code from the list, select the code that you want to remove and click **Remove**.

The screenshot shows the 'KMS Login' page within the 'Feature Activation Configuration' window. On the left, a navigation pane lists 'Welcome', 'Key Redemption Method', 'KMS Login' (selected), 'Connection', 'Automatic Reboot', and 'Summary'. The main content area is titled 'KMS Login' and contains the following fields and controls:

- A descriptive text: 'The user ID, password, and authorization codes will be used to log in to Key Management System (KMS) and redeem the key files. Add one or more authorization codes to the list.'
- Input fields for '*User ID:', '*password:', and '*Confirm password:'.
- An input field for 'Feature authorization code:'.
- An 'Add to List' button.
- A list box for '*Feature authorization code list:' with a 'Remove' button next to it.
- A note: '* Required field'.

At the bottom of the window are navigation buttons: '< Back', 'Next >', 'Finish', and 'Cancel'.

- **Connection page.** (This page displays only if you choose to obtain activation keys from KMS.) On this page you can specify how the management server accesses the Internet. You can choose direct connection or connection by proxy server. To connect through a proxy server, you must specify the proxy server host name, the port number, and the user name and password (if authentication is required). Click **Test Internet Connection** to make sure that the management server can successfully connect to the Internet.

The screenshot shows the 'Connection' page within the 'Feature Activation Configuration' window. On the left, the navigation pane lists 'Welcome', 'Key Redemption Method', 'KMS Login', 'Connection' (selected), 'Automatic Reboot', and 'Summary'. The main content area is titled 'Connection' and contains the following fields and controls:

- A descriptive text: 'An Internet connection is required to use this function. Specify how the Internet should be accessed.'
- Subtext: 'Specify settings for the Internet connectivity that IBM® Systems Director uses to obtain updates.'
- Section: 'Choose the method to use to access the Internet.'
- Two radio buttons: 'Connect to the Internet directly' (selected) and 'Connect to the Internet through an HTTP proxy server'.
- For the proxy server option, there are input fields for 'Proxy server host name:' and 'Port number:'.
- A checkbox for 'Proxy server requires authentication'.
- If the checkbox is checked, there are input fields for 'User name:' and 'Password:'.
- A 'Test Internet Connection' button.

At the bottom of the window are navigation buttons: '< Back', 'Next >', 'Finish', and 'Cancel'.

- Automatic Reboot page. On this page you can specify whether to reboot the configured resource automatically after the activation key is installed or to reboot manually later, if required.

The screenshot shows the 'Automatic Reboot' page within the 'Feature Activation Configuration' window. On the left, a vertical navigation pane lists the steps: Welcome, Key, Redemption Method, KMS Login, Connection, Automatic Reboot (highlighted with a blue icon), and Summary. The main content area is titled 'Automatic Reboot' and contains the instruction: 'Choose whether to reboot after the activation key is installed. If you choose not to reboot now, you must manually reboot later to complete the activation if required.' Below this is a checkbox labeled 'Automatically reboot the device after activation key installation, if necessary.' At the bottom right, there are four buttons: '< Back', 'Next >', 'Finish', and 'Cancel'.

- Summary page. This page summarizes the specified settings for the feature activation configuration. After you configure the settings, click **Finish** to save the feature activation configuration as a template.

The screenshot shows the 'Summary' page within the 'Feature Activation Configuration' window. The left navigation pane is the same as the previous page, with 'Summary' now highlighted. The main content area is titled 'Summary' and includes the instruction: 'Review the selections below and click Finish to accept.' It lists the configured settings: 'Key redemption method: KMS', 'User ID: userid', and 'Feature authorization code list: aaaaaa' (with a text box containing 'aaaaaa'). Below these, it shows 'Automatic reboot: No' and 'Connection: Use direct connection'. At the bottom right, the buttons are '< Back', 'Next >', 'Finish', and 'Cancel'.

Installing a Features on Demand activation key

You can install the Features on Demand activation key by one of the following methods:

- On demand
- Using a template

On demand installation

To use the On demand method to install a Features on Demand activation key, complete the following steps:

1. Follow steps 1 to 3 in “Retrieving a Features on Demand activation key” on page 32.
2. Select **Add Keys** to start the Feature Activation Configuration wizard.
3. Use the information in step 5 in “Creating a Feature Activation Manager template” on page 33 to configure the Features on Demand keys. Click **Finish** to open the Launch Job user interface. Select **Run Now** or **Schedule**.
4. If you select **Run Now**, an information message with a **Display Properties** button is displayed on top of the Feature Activation Configuration wizard.
5. Click **Display Properties** to open the Active and Schedule Jobs window.
6. Select the **General** tab to see the status of the job, or the **Logs** tab to see more detailed information about the job.

Deploy template installation

To use the deploy template method to install a Features on Demand activation key, complete the following steps:

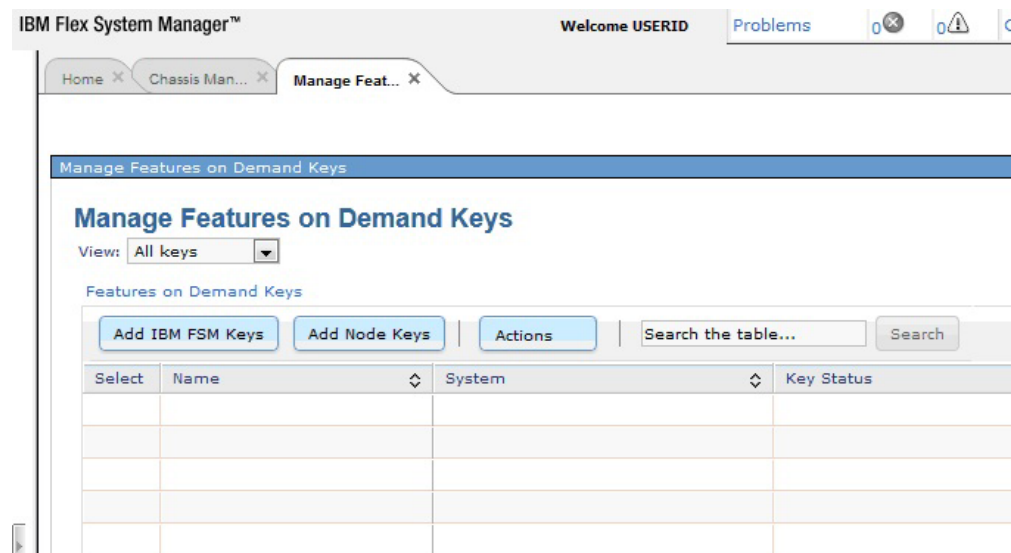
1. Follow the steps in “Creating a Feature Activation Manager template” on page 33.
2. Select **Feature Activation Manager Template** from the **Configuration Templates** table and click **Deploy**.
3. Select one or more systems and click **OK** to run the job immediately or go to the **Schedule** tab to schedule the job.
4. If you select to run the job immediately, an information message with a Display Properties button is displayed on top of the **Configuration Templates** table.
5. Click **Display Properties** to open the Active and Schedule Jobs window.
6. Select the **General** tab to see the status of the job, or the **Logs** tab to see more detailed information about the job.

Using IBM Flex System Manager to manage Features on Demand activation keys

You can use IBM Flex System Manager to manage Features on Demand activation keys and perform the following tasks:

- Display the Features on Demand keys that are available on the Flex System Manager
- Import a Features on Demand key and apply it to the Flex System Manager
- Create a new Feature Activation Manager Configuration template for the IMMv2, CMM, or switch by using the IBM Systems Director Configuration manager. For more information, see “Creating a Feature Activation Manager template” on page 33.

The following illustration shows an example of the Manage Features on Demand Keys window in IBM Flex System Manager.



For more information about IBM Flex System Manager, see http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp?topic=%2Fcom.ibm.acc.8731.doc%2Ffeatures_on_demand.html.

Emulex Virtual Fabric Adapter Features on Demand activation key process

This section provides additional information about the activation of optional Virtual Fabric Adapter (VFA) function by using the application of Features on Demand activation keys on Emulex Virtual Fabric Adapter on IBM System x products.

Use the activation key process in this section for the options that are listed in Table 2 when they are installed in the IBM systems that are listed in Table 2.

Table 2. Emulex VFA options and IBM systems

IBM system	Option
<ul style="list-style-type: none">• IBM BladeCenter HS23, Type 7875, any model• IBM Flex System x220 Compute Node, Type 2585, any mode• IBM Flex System x220 Compute Node, Type 7864, any model• IBM Flex System x220 Compute Node, Type 7906, any model• IBM Flex System x240 Compute Node, Type 8737, any model• IBM System x3250 M4, Type 2583, any model• IBM System x3330 M4, Type 7382, any model• IBM System x3500 M4, Type 7383, any model• IBM System x3550 M4, Type 7914, any model• IBM System x3630 M4, Type 7158, any model• IBM System x3650 M4, Type 7915, any model• IBM System x3750 M4, Type 8722, any model• IBM System x3750 M4, Type 8733, any model• IBM iDataPlex dx360 M4 2U chassis, Type 7913, any model• IBM iDataPlex dx360 M4 server, Type 7912, any model	<ul style="list-style-type: none">• Emulex 10 GbE Virtual Fabric Adapter III for IBM System x, option 95Y3764, any CRU• Flex System CN4054 10 Gb Virtual Fabric Adapter, option 90Y3554, any CRU

The following section describes how to retrieve and display the Emulex ASIC unique identifier. After you have the Emulex ASIC unique identifiers for your system, go to the IBM Features on Demand web portal at <http://www.ibm.com/systems/x/fod/> to create and retrieve your activation key. For more information about the process to redeem your authorization code for an activation key, see the information that comes with the authorization code and see Chapter 3, “System feature activation,” on page 19.

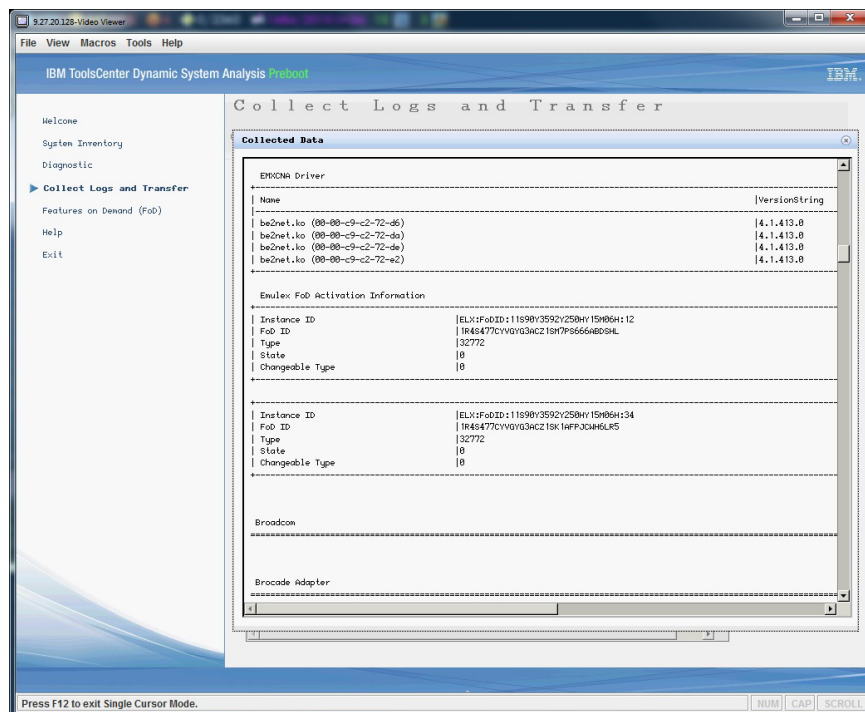
Getting the Emulex ASIC unique identifier

Emulex activation of the Fibre Channel over Ethernet (FCoE) / iSCSI optional upgrade on third-generation VFA units is based on the presence of a Features on Demand (FoD) activation key for the unit that is being activated. The unit of activation is the physical Emulex Application Specific Integrated Circuit (ASIC) that is either embedded in the IBM System x server or on the Emulex VFA III option that is installed in the system. As with other Features on Demand features, the activation process requires the unique identifier of the unit at the time the activation key is requested. For an Emulex VFA, the unique identifier is unique to the ASIC of the adapter and is in a different format than the system machine type and serial number. To obtain the unique identifier of the Emulex ASIC for the ports that you are activating, you can use the Preboot Dynamic System Analysis (pbDSA) utility to inventory the system or you can use the Emulex command-line hbacmd utility, which is distributed as part of the Emulex software support for VFA III adapters from IBM.

Using pbDSA utility to retrieve and display a unique identifier

If you are using the pbDSA utility, complete the following steps to retrieve and display the Emulex ASIC unique identifiers for the system:

1. Initialize the system into the pbDSA environment by pressing F2 when prompted during system initialization. You can skip the memory test portion of pbDSA startup to save time in this process.
2. Launch the GUI from the pbDSA initial startup screen.
3. From the pbDSA GUI navigation menu, select **Collect Logs and Transfer**. It can take over 30 minutes for the process to be completed.
4. After the data collection is completed, select the result file hyperlink in the result window. The collected data is displayed.
5. Scroll down through the collected data to the section **Emulex FoD Activation Information**. A Features on Demand ID is displayed for each ASIC in the system, as shown in the following illustration.



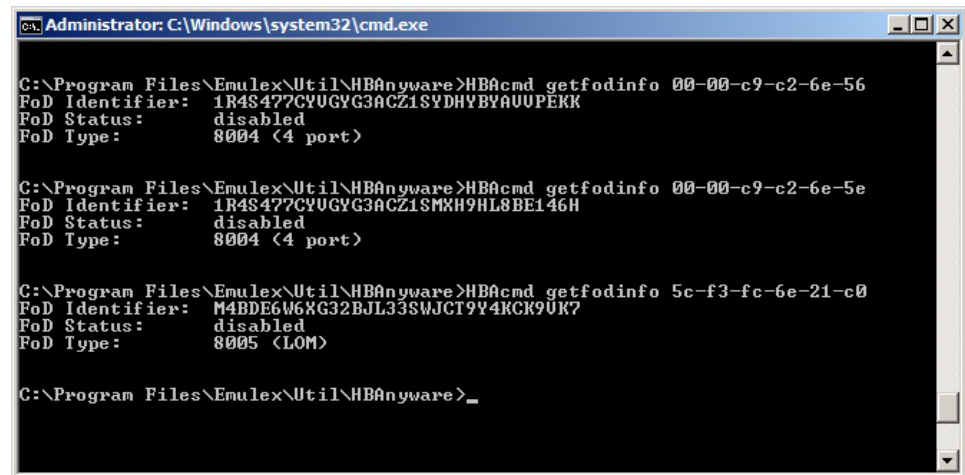
Using hbacmd utility to retrieve and display a unique identifier

If you are using the Emulex hbacmd command-line utility from a supported operating system environment, complete the following steps to retrieve and display the Emulex ASIC unique identifiers for the system:

1. Start the system and log into the operating system with administrator privilege.
2. Launch a command shell and navigate to the directory where the hbacmd utility is installed.
3. Using an operating system utility (for example, Device Manager for Windows operating systems or ifconfig for Linux operating systems), determine the MAC addresses corresponding to the Emulex adapters.
4. For each MAC address found in step 3, run the hbacmd utility with the following syntax:

```
hbacmd getfodinfo mac
```

where *mac* is replaced with the MAC address. The MAC address can be entered with dashes or colons between the octets. A sample of this process is shown in the following illustration.



```
Administrator: C:\Windows\system32\cmd.exe

C:\Program Files\Emulex\Util\HBAnyware>HBacmd getfodinfo 00-00-c9-c2-6e-56
FoD Identifier: 1R4S477CYUGYG3ACZ1SYDHYBYAUUPEKK
FoD Status: disabled
FoD Type: 8004 <4 port>

C:\Program Files\Emulex\Util\HBAnyware>HBacmd getfodinfo 00-00-c9-c2-6e-5e
FoD Identifier: 1R4S477CYUGYG3ACZ1SMXH9HL8BE146H
FoD Status: disabled
FoD Type: 8004 <4 port>

C:\Program Files\Emulex\Util\HBAnyware>HBacmd getfodinfo 5c-f3-fc-6e-21-c0
FoD Identifier: M4BDE6W6XG32BJL33SWSJCT9Y4KCK9UK7
FoD Status: disabled
FoD Type: 8005 <LOM>

C:\Program Files\Emulex\Util\HBAnyware>
```

Depending on the configuration of the Emulex adapter, you might have multiple MAC addresses that map to the same ASIC and therefore have the same unique identifier. You need only one activation key for each unique identifier in the system.

Feature upgrades

There are four distinct Emulex VFA III feature upgrades that are available. You must use the upgrade and activation key for the type of upgrade that you are requesting. For example, if you use an upgrade authorization code for a CN4054 VFA and a unique identifier labeled as LOM (type 0x8005/37773), the result is an activation key that fails to activate the upgrade feature on the system.

Features on Demand features are identified by a feature descriptor type. Feature descriptor types are shown in hexadecimal format in Features on Demand key file names and the Emulex hbacmd utility output, and they are shown in decimal format in DSA output.

The following list shows the correlation of the Emulex feature descriptor types to Emulex VFA III hardware options.

Table 3. Feature descriptor type (hexadecimal and decimal)

Option	Feature descriptor type in hexadecimal format	Feature descriptor type in decimal format
Virtual Fabric Advanced FOD Upgrade for IBM BladeCenter	0x8001	37769
IBM Flex System CN4054 10Gb Virtual Fabric Adapter	0x8004	32772
IBM Virtual Fabric Advanced Software Upgrade (LOM)	0x8005	32773
Emulex 10 GbE Virtual Fabric Adapter III for IBM System x	0x800b	32779

When you receive an activation key file from IBM, it is named using the following format:

`ibm_fod_type_identifier_anyos_noarch.key`

Where *type* is the 4-digit hexadecimal feature descriptor type from Table 3 and *identifier* is the last 16 digits of the Emulex ASIC identifier that you entered to create the key.

You must install the correct activation keys into the system in which the Emulex options are installed. The IMM2 is unable to read the Emulex ASIC identifier, so it marks the keys as installed, but they have to be validated by the Emulex firmware during UEFI system initialization. The IMM2 status for these keys does not change if they are in use or not in use by the Emulex options that are installed in the system.

To determine if a key has activated the upgrade feature, the hbacmd or pbDSA utilities can be used to view the activated status of the adapters after the activation keys are installed. In the hbacmd output, the Features on Demand status line shows Enabled when the key is accepted by the Emulex ASIC for activation. In the pbDSA output, the State entry is a **1** for an activated ASIC.

Chapter 4. Troubleshooting

This chapter provides some problems, the possible cause, and how to fix it.

Table 4. Features on Demand troubleshooting

Symptom	Possible cause	Fix
Machine type and serial number are not seen in the Features on Demand website	If the system board was replaced, the vital product data (VPD) on the new system board might not be updated with the machine type and serial number.	Follow the instruction in the <i>Problem Determination and Service Guide</i> for the system to update the VPD. The instructions are in the remove and replace the system board sections.
Feature shows in the Features on Demand website, but the function does not work	There might be a problem with the hardware.	Use the <i>Problem Determination and Service Guide</i> to isolate the problem. If the issue cannot be resolved, contact Hardware Support.
Feature is not working	The feature might not be set up as authorized on Features on Demand	Follow the steps in this <i>User Guide</i> to activate or reactivate your feature.
	The feature is entitled to a specific server, which is not the server the adapter is installed in.	Moving the adapter will deactivate the feature by separating it from its key file/entitled hardware pair.
	The feature is attached to a movable adapter, which has been installed in a new system, but the key has not also been moved to the new system.	The feature activation key must be installed on the system where the adapter is installed to be activated. You can obtain a copy of the entitled key for the adapter from the KMS website or by exporting it from the system it was previously installed in.
	The feature key unique identifier does not match the target identifier.	Make sure that the unique identifier embedded in the key matches the identifier in the file. The unique identifier is case sensitive. The key file is a binary file and the critical fields can be viewed with a text editor. The unique identifier is displayed between the system description and the feature description text in the key file.

System board replacement

The Features on Demand activation keys for server-based and chassis-based keys are stored on the system board on the Integrated Management Module II (IMM2) or the Chassis Management Module (CMM) respectively. As such, activation keys are not easily lost, except if the system board is replaced.

To prevent the loss of activation key information if the system board is replaced, use the following best practices guidelines:

- If the system board is replaced, make sure that the vital product data (VPD) for the machine type and serial number (MTSN) are restored to their original values. Most of the Features on Demand activation keys are tied to MTSN and do not work if the system MTSN is changed. For more information about restoring the VPD information, see the system *Problem Determination and Service Guide*.
- Periodically run the DSA tools to obtain the report on the Features on Demand features that are activated on your system. Store this information in an external storage device so that in the event of a system board failure, you have the key information readily available.

Note: The key activation history can be obtained from the IBM Features on Demand website (KMS), if needed. If you have trouble retrieving the key history from the Features on Demand website, contact IBM support as described in Chapter 5, “How to get help with Features on Demand,” on page 47.

- If the system board is replaced and the VPD data is restored to the original values, you can import the existing activation keys.

Adapter replacement guidelines

Some Features on Demand keys activate optional function on adapters, such as activating additional ports or a network function such as Fibre Channel over Ethernet. If a repair action requires that you replace an adapter on which an Features on Demand feature is activated, a new Features on Demand key might be required. Most Features on Demand features are associated with the machine type and serial number of the server, in this case, the Features on Demand feature will be available as soon as the new adapter is installed in the server. However, some server-based options are tied to a different UID, which might be the case for a network adapter. If the Features on Demand function is tied to a different UID, a new key must be generated. To obtain a new Features on Demand activation key, contact IBM support as described in Chapter 5, “How to get help with Features on Demand,” on page 47.

Chapter 5. How to get help with Features on Demand

Many answers to questions you might have about IBM registration, Features on Demand website functions, activating or reactivating features, or lost features can be found in this *User's Guide*.

If you need technical assistance for the feature that you have purchased, review the *Problem Determination and Service Guide* for your product. If you are unable to find the answers to your questions, contact IBM support at <http://www.ibm.com/planetwide/>.

The Features on Demand team can assist with activation, lost keys, and reactivation questions worldwide.

How you can contact IBM:

- Features on Demand support. Go to <http://www.ibm.com/systems/x/fod/> and click **Contacts** in the left navigation pane.
- English-only email request to FOD@us.ibm.com.
- Local language level 1 submissions through IBM Support for your software product. For software contacts in your country, go to <http://www.ibm.com/planetwide/>.

If you are unable to access the Features on Demand website, you can send an email directly to FOD@us.ibm.com. Make sure that you enter FOD in the subject line of the email.

Before you submit a Features on Demand request for support, make sure that you have the following information available:

- Customer name
- Phone number
- Email address
- Machine type and serial number of the system, and if applicable, the unique identifier (UID) of the device with the feature
- Authorization Code
- Any specific details you want to provide

Appendix A. Features on Demand MIB

This chapter provides the Features on Demand management information base (MIB).

```
-- *****
-- *****
--
-- File      : fod.mib
-- Description : MIB definitions for IBM Features On Demand Activation Key
--              functions.
-- By        : IBM
-- Version    : 1.6
-- Date      : March 20, 2012
--
--
-- Copyright (c) 2010-12 IBM All Rights Reserved.
--
--
-- Contains MIB description for:
--   This MIB is to be used to provide configuration support of IBM Features
--   on Demand features.
-- *****
-- *****
-- *****
-- Revisions:
-- *****
IBM-FEATURE-ACTIVATION-MIB DEFINITIONS ::= BEGIN

    IMPORTS
        MODULE-IDENTITY, OBJECT-TYPE,
        enterprises, NOTIFICATION-TYPE
            FROM SNMPv2-SMI --RFC2578
        MODULE-COMPLIANCE, OBJECT-GROUP,
        NOTIFICATION-GROUP
            FROM SNMPv2-CONF --RFC2580
        DateAndTime, DisplayString
            FROM SNMPv2-TC --RFC2579
        Uri
            FROM URI-TC-MIB; --RFC5017

    ibmFeatureActivationMIB MODULE-IDENTITY
        LAST-UPDATED "201203201341Z" --20 March 2012 13:41 GMT
        ORGANIZATION "International Business Machines Corp."
        CONTACT-INFO
            "Fred Bower

            International Business Machines Corporation
            Systems and Technology Group System x Development
            Research Triangle Park, NC, USA

            E-mail: bowerf@us.ibm.com"
        DESCRIPTION
            "This module provides a simple interface for
            IBM Features On Demand Activation Key functions."
        -- Revision History
        REVISION "201203201341Z" --20 March 2012
        DESCRIPTION
            "Added return code definition for file exists
            at location specified in URI for inventory and
            export actions and also for permission problems
            with specified user credentials/protocol in URI."
        REVISION "201202021538Z" --2 February 2012
        DESCRIPTION
            "Added return code definition for device still
```

```

        performing key action requested to indicate
        that a long-running process is still pending
        completion. Users should poll status until this
        status clears."
REVISION    "201108111805Z"          --11 August 2011
DESCRIPTION
    "Added return code definition for pre-requisite
    key action required to indicate that another key
    must be installed or uninstalled prior to the
    action attempted by the command that triggers this
    return code."
REVISION    "201106072003Z"          --7 June 2011
DESCRIPTION
    "Updated return code definitions to include
    return code for protocol not supported when
    URI specifies protocol not supported by device."
REVISION    "201103300733Z"          --30 March 2011
DESCRIPTION
    "Updated data types and added traps for status
    change notification. Clarified return codes
    from events."
REVISION    "201102021949Z"          --2 February 2011
DESCRIPTION
    "Added support for SFTP protocol file transfers."
REVISION    "201012081833Z"          --8 December 2010
DESCRIPTION
    "Initial Revision."
::= { ibmArchitecture 31 }

-- IBM enterprise group
ibm          OBJECT IDENTIFIER ::= { enterprises 2 }

-- IBM architecture group
ibmArchitecture OBJECT IDENTIFIER ::= { ibm 5 }

-- Features on Demand Objects
ibmFodNotifications OBJECT IDENTIFIER ::= { ibmFeatureActivationMIB 0 }
ibmFodObjects OBJECT IDENTIFIER ::= { ibmFeatureActivationMIB 1 }
ibmFodConformance OBJECT IDENTIFIER ::= { ibmFeatureActivationMIB 2 }

-- *****
-- Activation Key Install/Update
-- *****
-- Feature activation keys can be installed (to activate), uninstalled
-- (to deactivate), exported (for backup purposes), and inventoried.
-- The action desired is set via the ibmFodAction object (which is never
-- read). The required sub-objects and their use is listed here as well
-- as in the DESCRIPTION comments for each of the fields for user
-- understanding.
-- Action: installActivationKey
-- Requires: ibmFodFileUri
-- Process: Installer sets the ibmFodFileUri field to indicate where to
-- retrieve activation key file from, then sets the ibmFodAction to
-- installActivationKey.
-- Result: Activation key is transferred from URI to the target device,
-- validated, and result is available for reading via ibmFodStatus. An
-- alert should also be issued if the key actually changes device state.
-- That is, if the key is successfully validated and stored and function
-- is either queued for activation after a reboot or is activated, an
-- alert should be generated with the updated key status information.
--
-- Action: inventoryInstalledActivationKeys
-- Requires: ibmFodFileUri
-- Process: Administrator sets ibmFodFileUri field to indicate where to
-- place file with results of inventory of device, then sets ibmFodAction
-- to inventoryInstalledActivationKeys.
-- Result: Activation key inventory is transferred to URI from target

```



```

-- device and result is available for reading from ibmFodStatus.
-- Inventory file format is comma-separated with fields ordered as
-- follows:
--
-- <Index>,<Status>,<Feature Descriptor Type Description (text)>,
-- <Constraint Descriptor Type Description (text)>:<Constraint Descriptor
-- Type Optional Information (text)> 0..n
--
-- The 0..n notation is to indicate that there may be zero or more
-- constraints for any given activation key. New records start with a
-- newline character after the last constraint. If a constraint does not
-- have optional information text, the colon separator is omitted and a
-- comma denotes the start of the next constraint descriptor type
-- description. This activity should not result in any alerts, as it
-- does not alter activation key state on the device.
--
-- Action: uninstallActivationKey
-- Requires: ibmFodIndex
-- Process: Administrator sets ibmFodIndex with value from inventory
-- report process, above, then sets ibmFodAction to
-- uninstallActivationKey.
-- Result: Activation key is uninstalled and result of action is placed
-- in ibmFodStatus for reading. An alert should also be issued if the
-- action changes device state. That is, if there is a key at the
-- designated index and it is uninstalled, the device key state will
-- change, thus triggering an alert with the updated device information.
--
-- Action: exportActivationKey
-- Requires: ibmFodIndex, ibmFodFileUri
-- Process: Administrator sets ibmFodIndex with value from inventory
-- report process, above, then sets ibmFodFileUri to the desired location
-- for the exported key file to be placed, then sets ibmFodAction to
-- exportActivationKey.
-- Result: Activation key file is exported to designated URI location
-- provided that the index supplied maps to an existing key. Status of
-- the command is placed in ibmFodStatus for reading. No alert will be
-- issued from this activity, as it does not affect activation key state
-- on the device.
--
ibmFodAction OBJECT-TYPE
    SYNTAX INTEGER {
        installActivationKey(1),
        uninstallActivationKey(2),
        exportActivationKey(3),
        inventoryInstalledActivationKeys(4)
    }
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
        "Target action for activation method.
         1 - Install Activation Key
         2 - Uninstall Activation Key
         3 - Export Activation Key
         4 - Inventory Installed Activation Keys"
    DEFVAL { 4 }
    ::= { ibmFodObjects 1 }

ibmFodIndex OBJECT-TYPE
    SYNTAX INTEGER (1..255)
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
        "Activation key index to uninstall or export.
        This is only required for uninstall and export actions.
        This is also used to identify the key associated with alerts."
    ::= { ibmFodObjects 2 }

```

```

ibmFodFileUri OBJECT-TYPE
    SYNTAX Uri
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
        "URI of where key file resides for install and
        where it should be placed for export or inventory.
        This is not used for uninstall action."
    ::= { ibmFodObjects 3 }

ibmFodStatus OBJECT-TYPE
    SYNTAX INTEGER {
        success(1),
        rebootRequired(2),
        versionMismatch(3),
        corruptKeyFile(4),
        invalideKeyFileTarget(5),
        keyFileNotPresent(6),
        communicationFailure(7),
        keyStoreFull(8),
        ftpServerFull(9),
        userAuthenticationFailed(10),
        invalidIndex(11),
        protocolNotSupported(12),
        preRequisiteKeyActionRequired(13),
        actionIncompleteDeviceBusy(14),
        fileAlreadyExists(15),
        permissionProblem(16)
    }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Return status of the last firmware activation method
        initiated through SNMP method.
        Valid return codes are:
        Code Action(s) Meaning
        1 1,2,3,4 Success
        2 1,2 Reboot Required
        3 1 Firmware Version/Update Issue
        4 1 Key Corrupt
        5 1 Key Not Valid for Device
        6 1,2,4 Key File Not Found
        7 1,3,4 Failure to Communicate with File Server
        8 1 Key Storage Full
        9 3,4 TFTP/SFTP Server Storage Full
        10 1,3,4 SFTP User/Password Authentication Failed
        11 2,3 Invalid Index
        12 1,3,4 Protocol Specified in URI Not Supported
        13 1,2 Pre-Requisite Key Action Required
        14 1,2,3,4 Action Still In Process/Busy
        15 3,4 File Already Exists on Server
        16 3,4 Permission Problem with Specified URI User"
    ::= { ibmFodObjects 4 }

ibmFodKeyChangeTime OBJECT-TYPE
    SYNTAX DateAndTime
    MAX-ACCESS accessible-for-notify
    STATUS current
    DESCRIPTION
        "The date and time of the event described in
        this notification of activated function status change."
    ::= { ibmFodObjects 5 }

ibmFodKeyOldStatus OBJECT-TYPE
    SYNTAX INTEGER {
        noPreviousStatus (1),
        keyValid (2),

```

```

        keyInvalid (3),
        keyValidElsewhere (4),
        keyFeatureActive (5),
        keyFeatureRequiresHostReboot (6),
        keyFeatureRequiresBMCReboot (7),
        keyExpired (8),
        keyUseLimitExceeded (9),
        keyInProcessOfValidation (10)
    }
    MAX-ACCESS accessible-for-notify
    STATUS current
    DESCRIPTION
    "The prior status of the activation key associated
    with this status change."
    ::= { ibmFodObjects 6 }

ibmFodKeyNewStatus OBJECT-TYPE
    SYNTAX INTEGER {
        keyRemoved (1),
        keyValid (2),
        keyInvalid (3),
        keyValidElsewhere (4),
        keyFeatureActive (5),
        keyFeatureRequiresHostReboot (6),
        keyFeatureRequiresBMCReboot (7),
        keyExpired (8),
        keyUseLimitExceeded (9),
        keyInProcessOfValidation (10),
        keyReplaced (11)
    }
    MAX-ACCESS accessible-for-notify
    STATUS current
    DESCRIPTION
    "The new status of the activation key associated
    with this status change."
    ::= { ibmFodObjects 7 }

ibmFodKeyUpdateData OBJECT-TYPE
    SYNTAX DisplayString
    MAX-ACCESS accessible-for-notify
    STATUS current
    DESCRIPTION
    "String containing constraint data. This is only used
    for ibmFodNewStatus value of keyReplaced (10). Otherwise,
    this string should be NULL."
    ::= { ibmFodObjects 8 }

-- Notifications
ibmFodActivationChangeAlert NOTIFICATION-TYPE
    OBJECTS {
        ibmFodIndex,
        ibmFodKeyChangeTime,
        ibmFodKeyOldStatus,
        ibmFodKeyNewStatus,
        ibmFodKeyUpdateData
    }
    STATUS current
    DESCRIPTION
    "This is an SNMP notification of a change to an existing
    feature activation on an endpoint. Data in the
    notification payload describes the change."
    ::= { ibmFodNotifications 1 }

-- Conformance Information
-- Compliance Statements
ibmFeatureActivationCompliances OBJECT IDENTIFIER ::= { ibmFodConformance 1 }
ibmFeatureActivationGroups OBJECT IDENTIFIER ::= { ibmFodConformance 2 }

```

```

ibmFeatureActivationCompliance MODULE-COMPLIANCE
  STATUS current
  DESCRIPTION
    "The compliance statement for the IBM-FEATURE-ACTIVATION-MIB."
  MODULE --This module
  MANDATORY-GROUPS { ibmFeatureActivationBaseGroup,
                      ibmFeatureActivationNotifGroup }
  ::= { ibmFeatureActivationCompliances 1 }

-- MIB Groupings
ibmFeatureActivationBaseGroup OBJECT-GROUP
  OBJECTS {
    ibmFodAction,
    ibmFodIndex,
    ibmFodFileUri,
    ibmFodStatus,
    ibmFodKeyChangeTime,
    ibmFodKeyOldStatus,
    ibmFodKeyNewStatus,
    ibmFodKeyUpdateData
  }
  STATUS current
  DESCRIPTION
    "The group of mandatory objects for all implementations
    to be compliant."
  ::= { ibmFeatureActivationGroups 1 }

ibmFeatureActivationNotifGroup NOTIFICATION-GROUP
  NOTIFICATIONS { ibmFodActivationChangeAlert }
  STATUS current
  DESCRIPTION
    "The notification group required for compliance in alert
    semantics for feature activation implementations."
  ::= { ibmFeatureActivationGroups 2 }

END

```

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