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 71.

Fourth Edition (January 2013)

© Copyright IBM Corporation 2012, 2013.
US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

Chapter 1. Introduction 1
Overview 2
Managing the Features on Demand features 3
System requirements 3
Notices and statements in this document 4

Chapter 2. Using the IBM Features on Demand website 5
Registering with IBM 5
Activating the Features on Demand feature 8
Retrieving history 13
Managing the IBM customer number 15
Retrieving an authorization code 17
Generating a report 18
Using a trial key 20

Chapter 3. System feature activation 23
Manually installing a Features on Demand activation key on the IMM2 24
Manually removing a Features on Demand activation key on the IMM2 27
Using IBM ToolsCenter utilities to manage Features on Demand activation keys 29
Using the IBM Advanced Settings Utility 29
Using IBM Dynamic System Analysis 30
Using IBM Systems Director to manage Features on Demand activation keys 31
Prerequisite tasks before using IBM Systems Director Feature Activation Manager 32
Using IBM Systems Director Feature Activation Manager 35
Starting the Feature Activation Manager user interface from IBM Systems Director 36
Installing a Features on Demand activation key 42
Using IBM Flex System Manager to manage Features on Demand activation keys 43
Emulex Virtual Fabric Adapter Features on Demand activation key process 44
Getting the Emulex ASIC unique identifier 44
Feature upgrades 47

Chapter 4. Backing up activation keys 49
Backing up feature activation keys by using ASU 49
Exporting all activation keys from the local IMM key repository 49
Exporting all activation keys from a remote IMM key repository 50
Command example 51
Backing up Features on Demand UIDs by using Preboot DSA 52
Backing up Features on Demand UIDs by using Portable DSA 54

Chapter 5. Reactivating Features on Demand keys 55
Replacing a system board 55
Reactivating server-based or chassis-based keys (machine type and serial number) 55
Reactivating keys for UIDs that are not based on the machine type and serial number 56
For a device that is not integrated on the damaged system board 56
For a damaged device or a controller that is integrated on the damaged system board. 56
Replacing an adapter 60
Moving an adapter or controller 60

© Copyright IBM Corp. 2012, 2013

Chapter 6. Troubleshooting 61

Chapter 7. How to get help with Features on Demand 63

Appendix A. Features on Demand MIB 65

Appendix B. Notices 71
Trademarks 71
Important notes 72

Index 73

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.

© Copyright IBM Corp. 2012, 2013

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 23.

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)	• Key Management System (KMS) website • ASU and DSA • IMM2 web interface	• Intelligent Platform Management Interface (IPMI) • Keyboard Controller Style (KCS) • Common Information Model (CIM)	Server functions, for example: • IMM2 Advanced • RAID features • Network features
Chassis-based	Chassis Management Module (CMM)	• 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 29.

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 24 and "Manually removing a Features on Demand activation key on the IMM2" on page 27.

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

Notes:

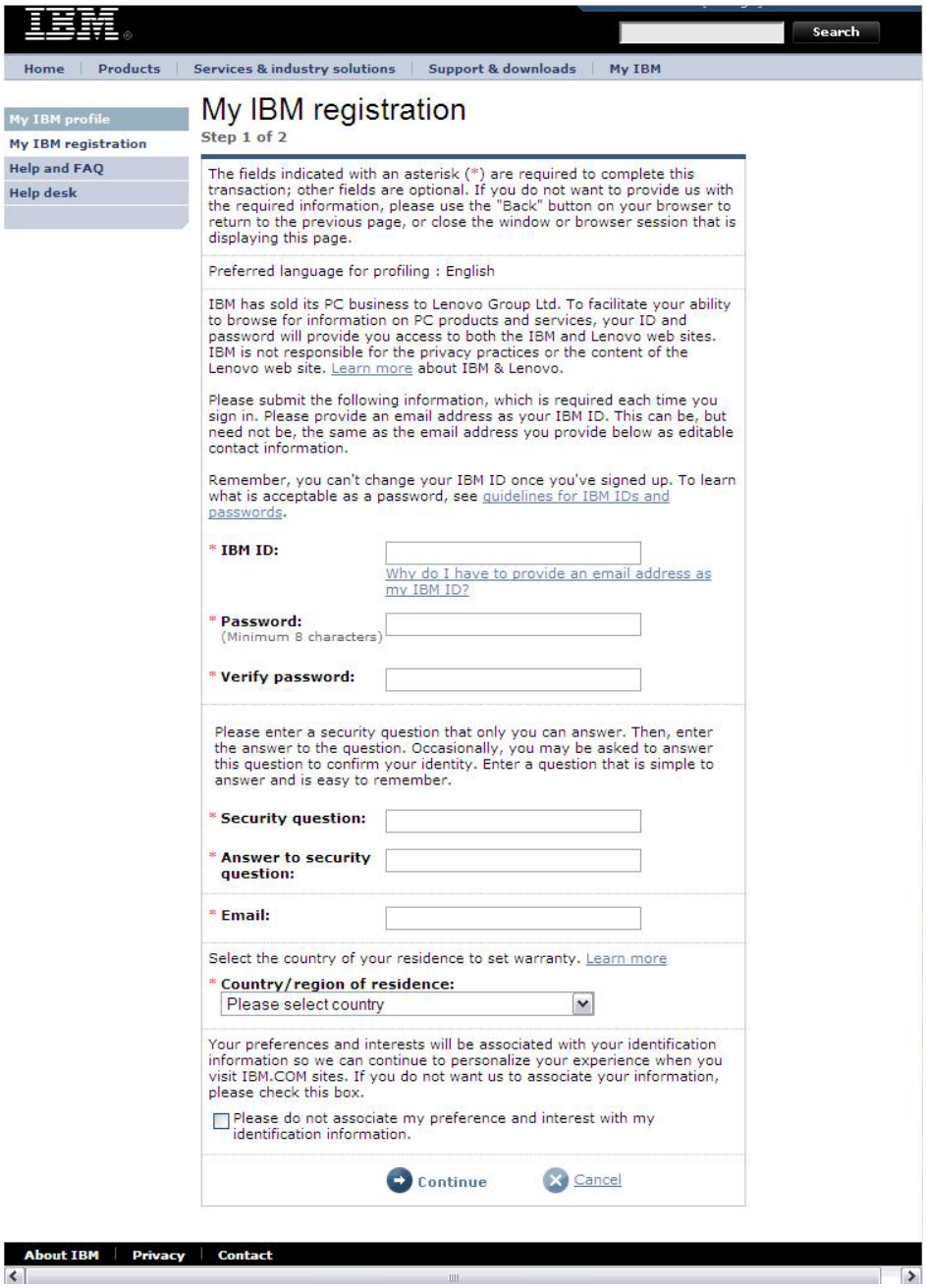
1. Your IBM ID and password are required to log in to the Features on Demand website. If you are not registered with IBM, go to http://www.ibm.com/systems/x/fod/ and click **register** on the bottom of the page.
2. For more information about a field or value on the Features on Demand website, hover the mouse pointer over the question mark (?) icon.

Registering with IBM

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

© Copyright IBM Corp. 2012, 2013

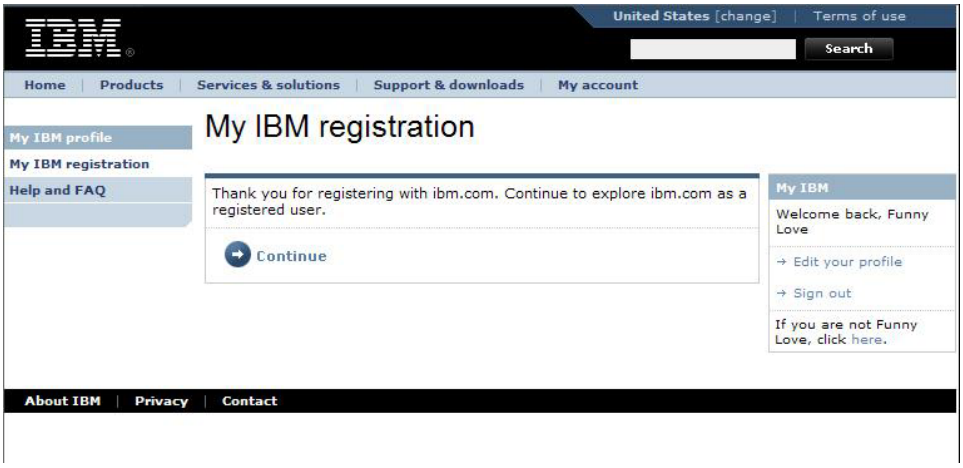
1. Go to http://www.ibm.com/systems/x/fod/ and click **register** on the bottom of the page. The My IBM Registration page opens.



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.

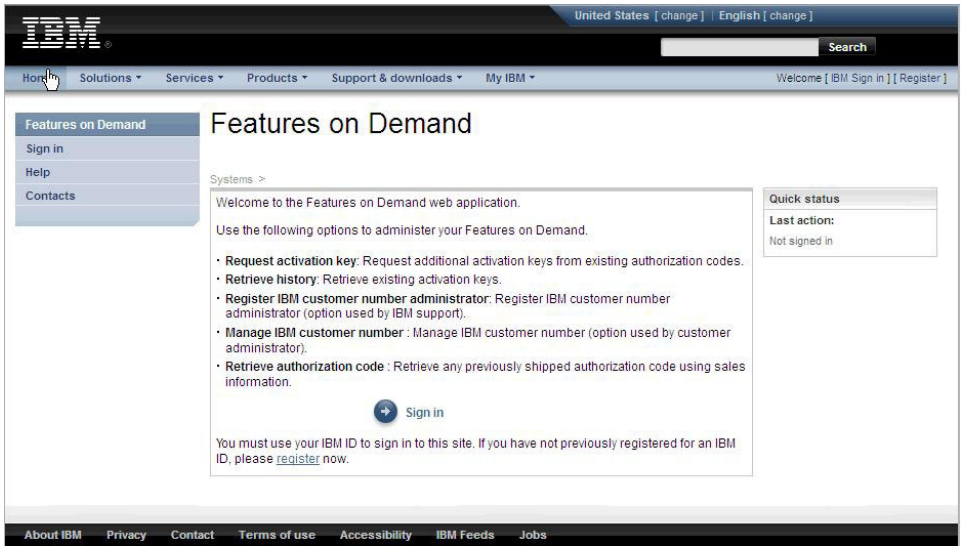
Activating the Features on Demand feature

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

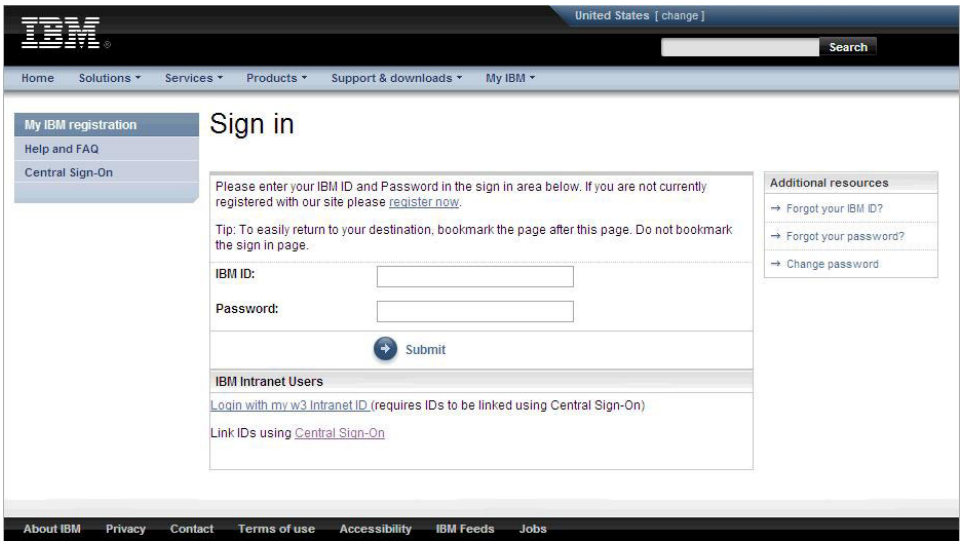
- Authorization code that is at the top of the *IBM Feature Activation Instructions* document that was sent to you in the mail
- Access to the hardware or software that you want to activate

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

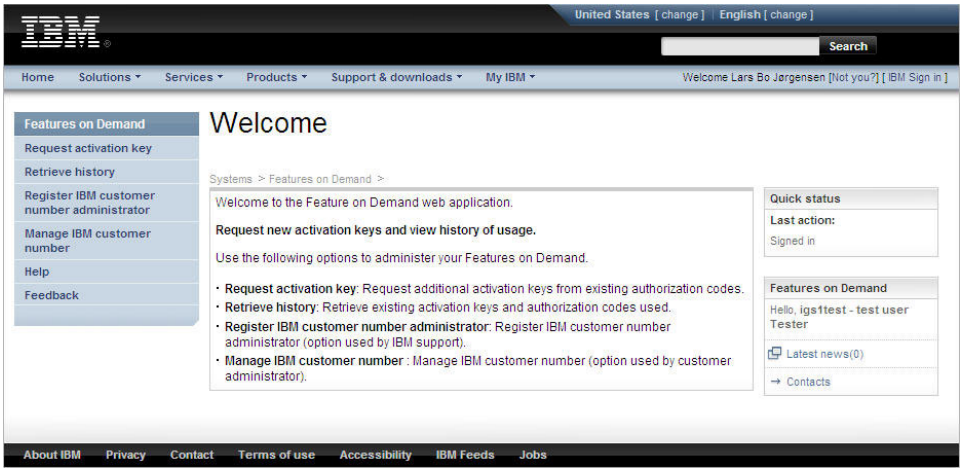
1. Go to http://www.ibm.com/systems/x/fod/. The Features on Demand page opens.



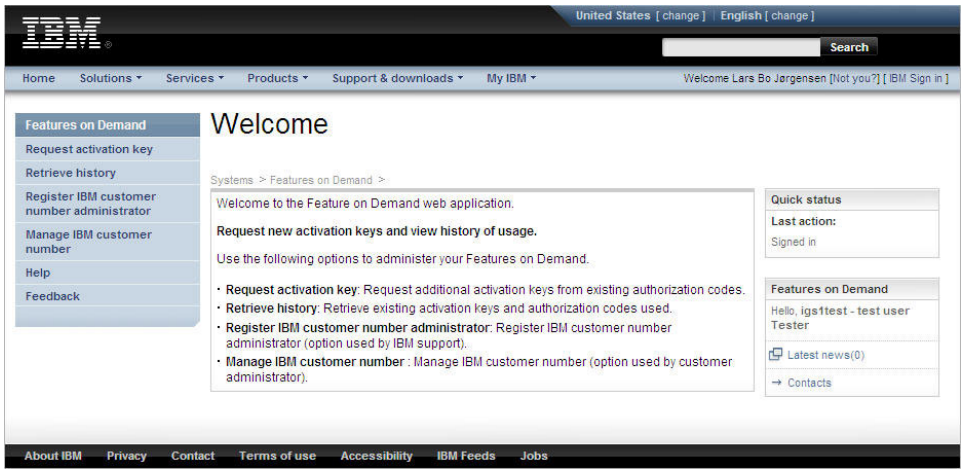
2. Click **Sign in**. The Sign in page opens.



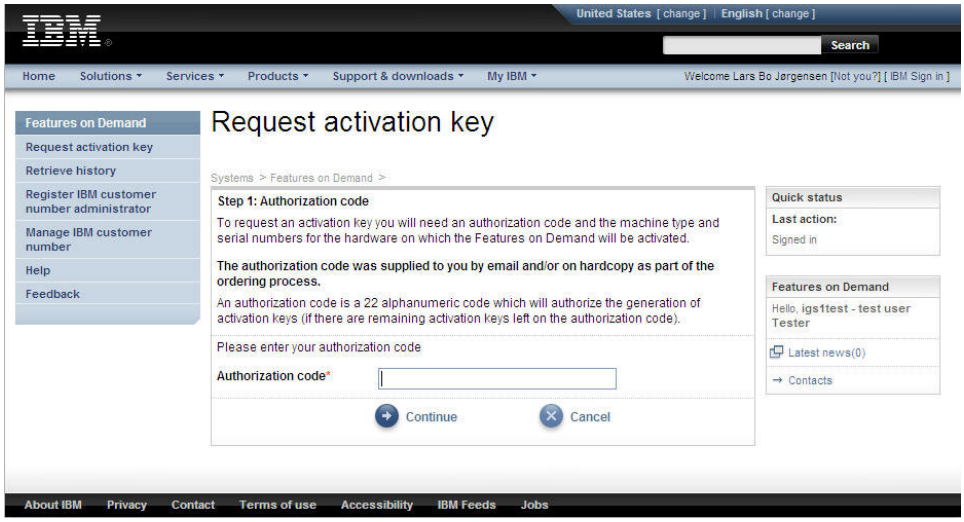
3. On the Sign in page, enter your IBM ID and password and click **Submit**. The Welcome page opens.



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



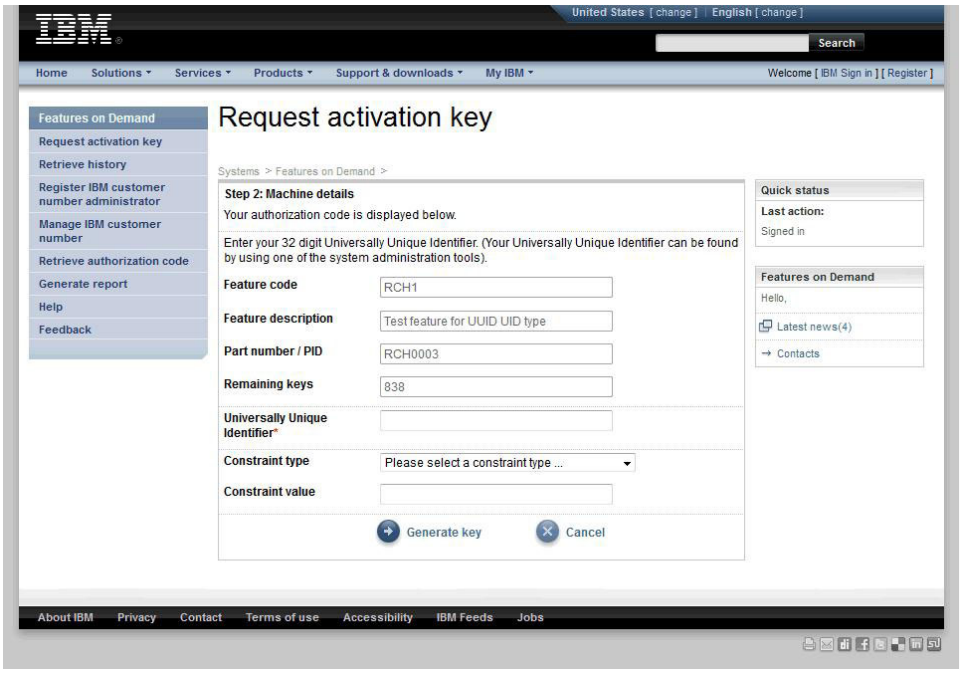
5. On the “Request activation key” page, enter the authorization code and click **Continue**.



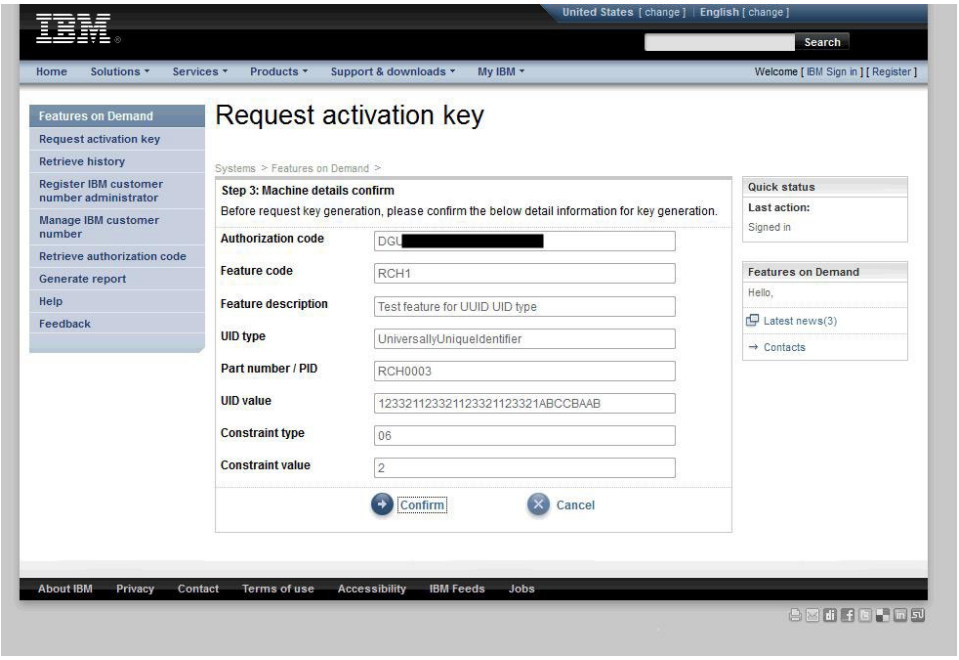
6. Enter the unique identifier (UID) specified for feature activation. If you do not know the UID that is requested, see the product documentation for further information about how to retrieve and enter the identifier in the key redemption process.

   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.



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



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 23 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 29.

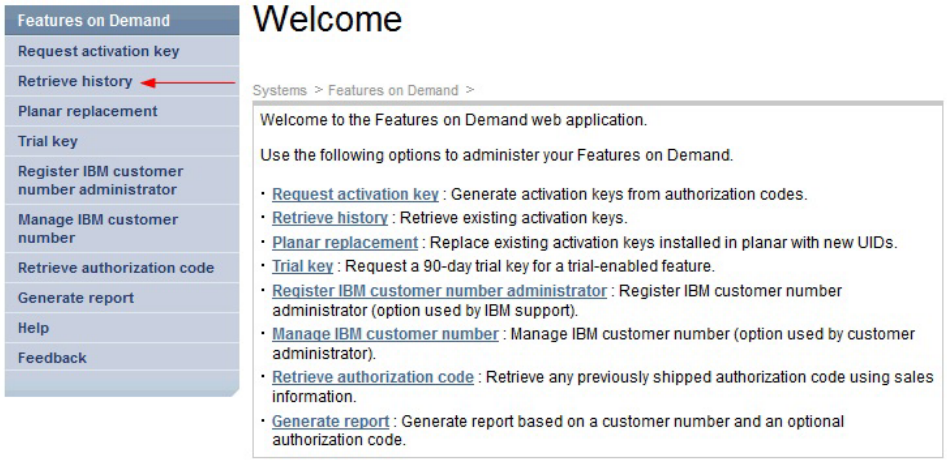
Retrieving history

On the “Retrieve history” page, you can use the authorization code, unique identifier (UID), or the machine type and serial number 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 machine type and serial number lists all activation keys that are generated for the machine type and serial number. The results from a search using the UID are the activation keys that are associated with their own UID, but are installed in the system or chassis with the machine type and serial number that you entered or selected.

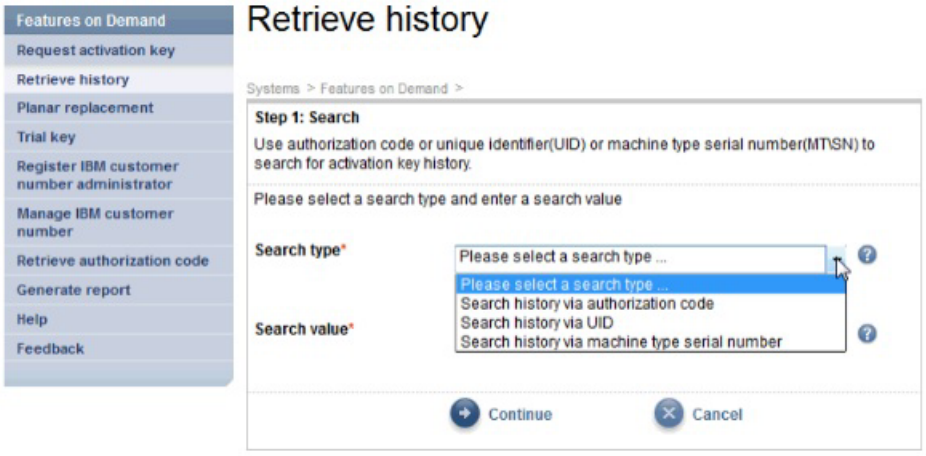
Note: For more information about a field or value on the Features on Demand website, hover the mouse pointer over the question mark (?) icon.

To retrieve the activation key history, complete the following steps:

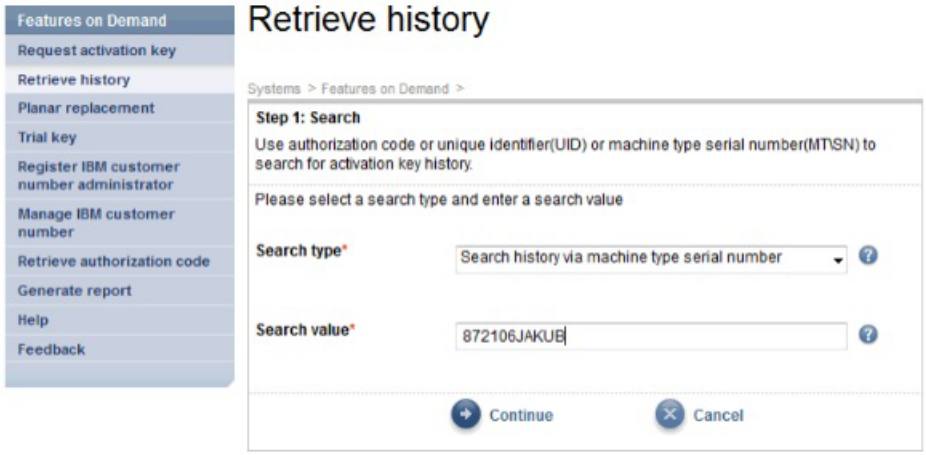
1. Select **Retrieve history** from the left navigation pane.



2. Enter the authorization code, UID, or the machine type and serial number. Click **Continue**.

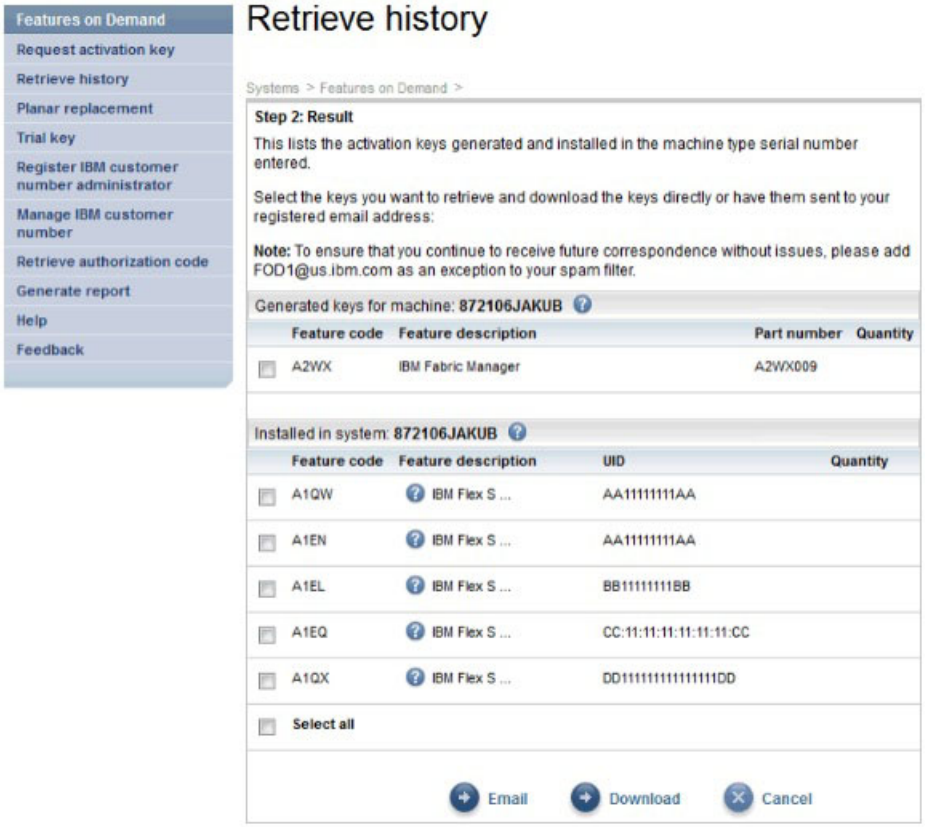


3. Enter a value corresponding to the search selection and click **Continue**.



Note: Depending on the search selection, the information that is displayed in the Results window will be different.

4. Select one or more active keys to email or to download.



Note: The search results provide the following information:

- Generated keys: Features on Demand activation keys that are associated with the machine type and serial number of your system or chassis
- Installed keys: Features on Demand activation keys that are associated with their own UID but are installed in the selected system or chassis machine type and serial number

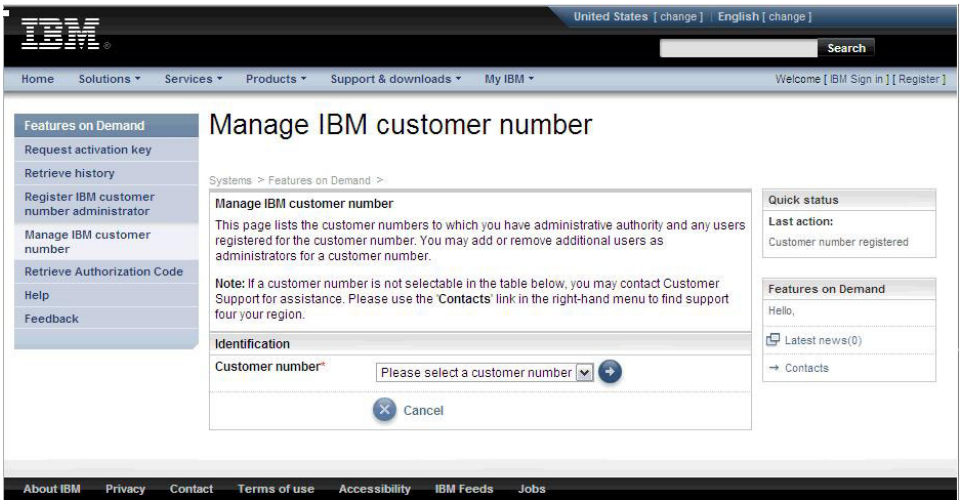
Managing the IBM customer number

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.

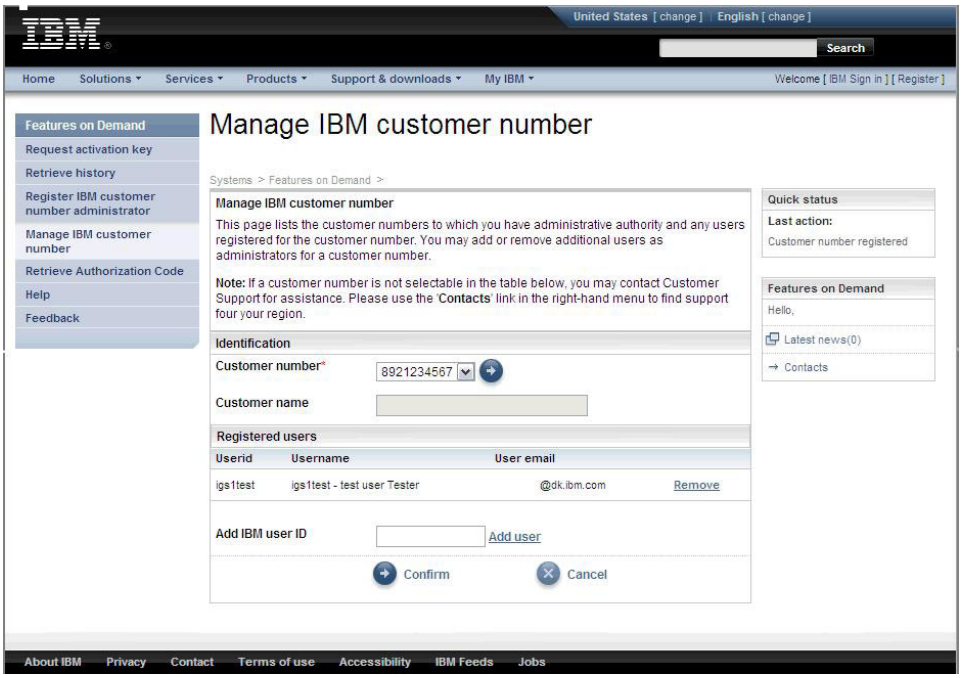
Note: If you cannot select a customer number in the **Customer number** field, click **Contacts** in the right navigation pane to contact customer support for your region.

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

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



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



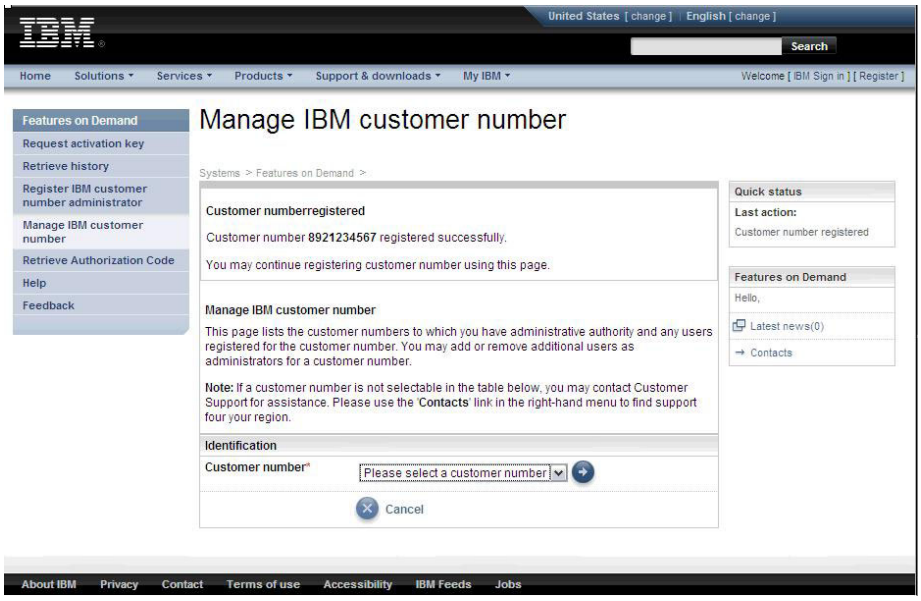
3. To link additional users to your customer number, complete the following steps.

   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**.



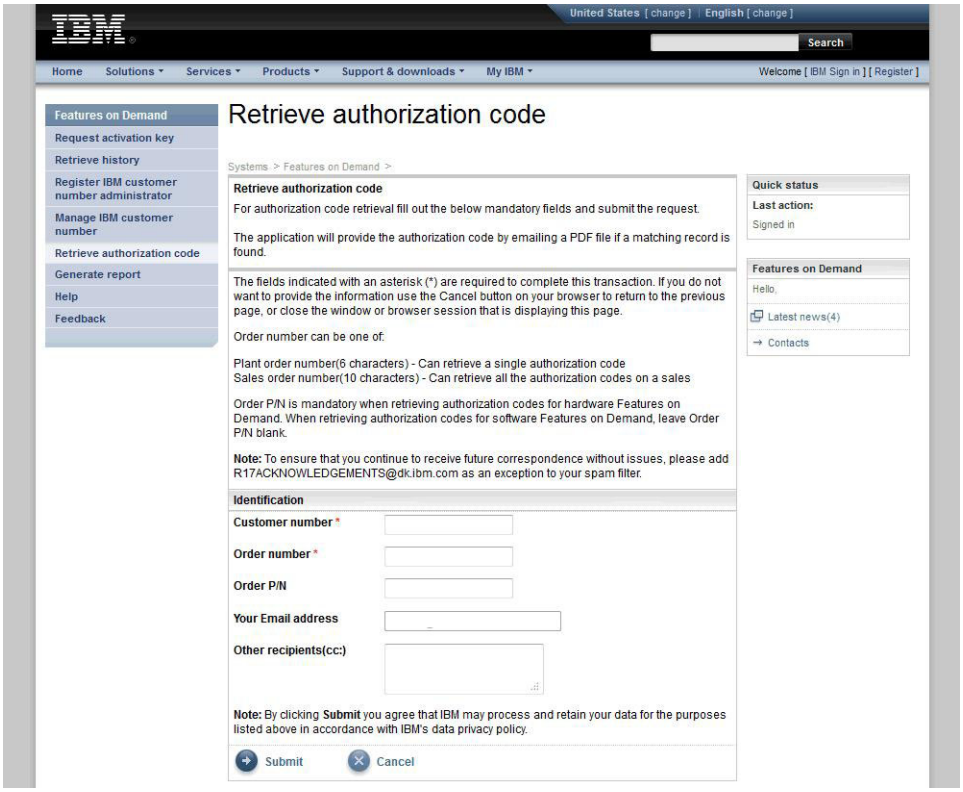
All users who are linked to a customer number will receive authorization codes through email for future orders that are placed. However, authorization codes for some software-based Features on Demand features are only delivered by mail.

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.



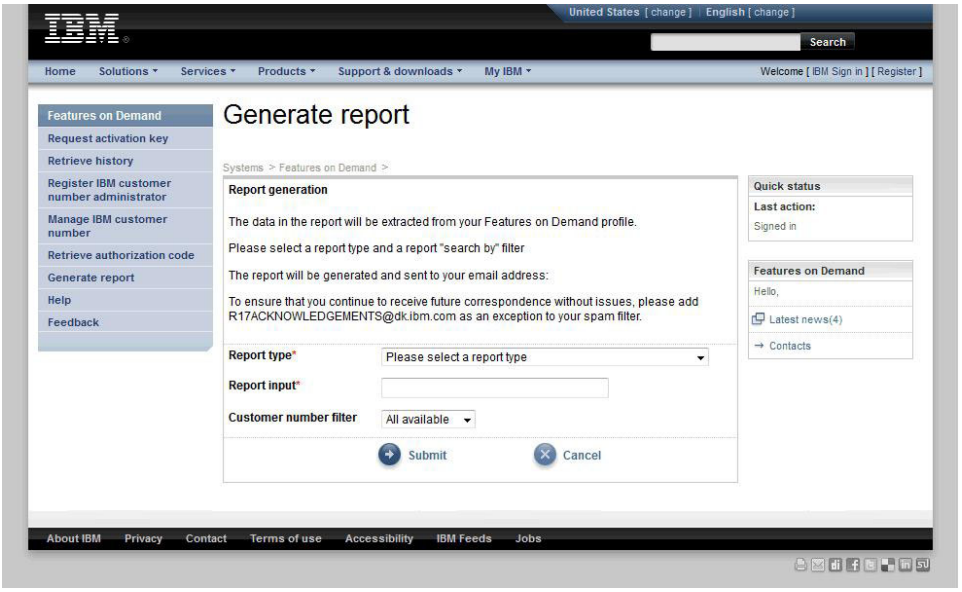
2. Enter the customer number with country code, plant order number, and order part number or product ID. These numbers are on the packing list that comes with your order. The **Your Email address** field is automatically populated with the user email address. In the **Other recipients** field, separate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

Generating a report

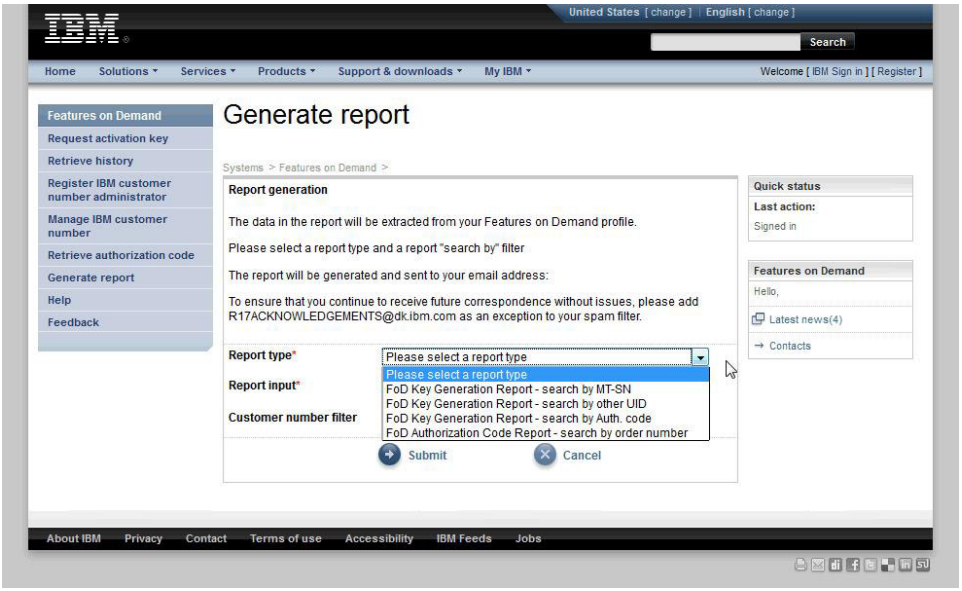
On the “Generate report” page, you can create several report types based on specified criteria and entered information. A comma separated value (.csv) document with the results is emailed to you.

To generate a report, complete the following steps:

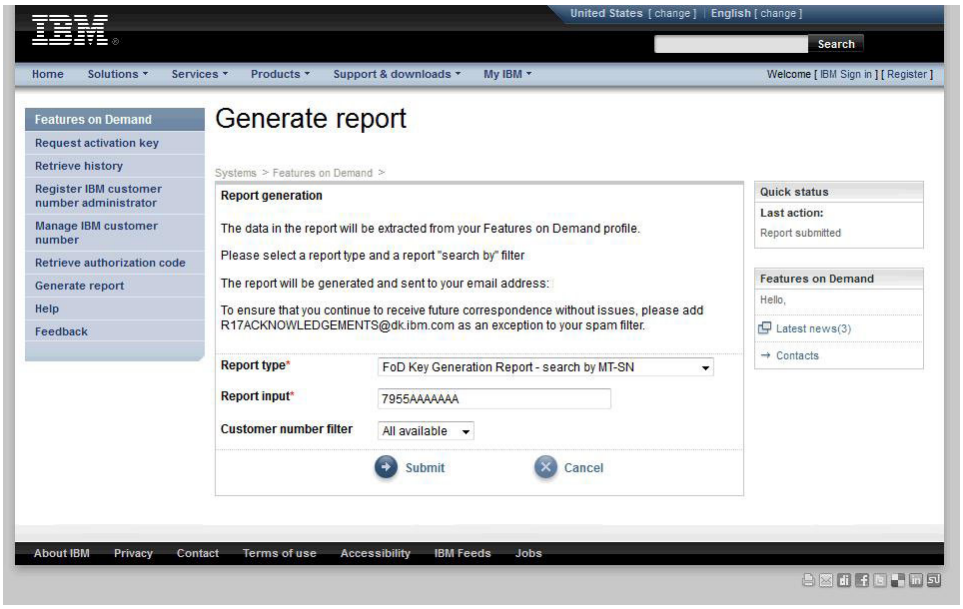
1. Select **Generate report** from the left navigation pane.



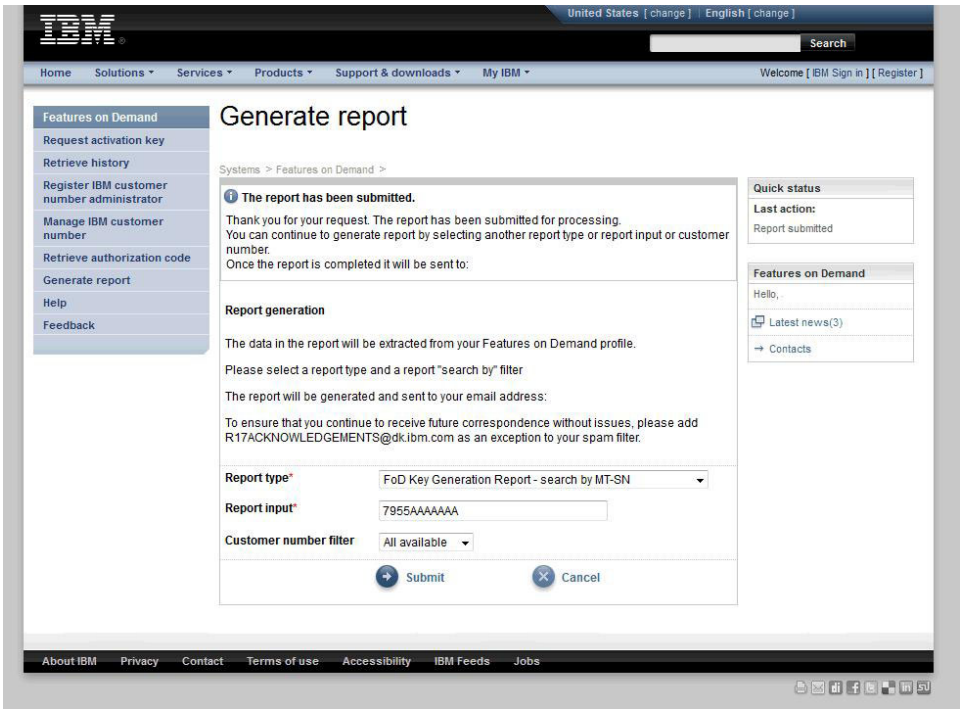
2. Select a report type in the **Report type** field. You can generate reports based on searches of the following information:
   - Machine type and serial number
   - Other UID
   - Authorization code
   - Order number



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



4. 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.
5. 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.

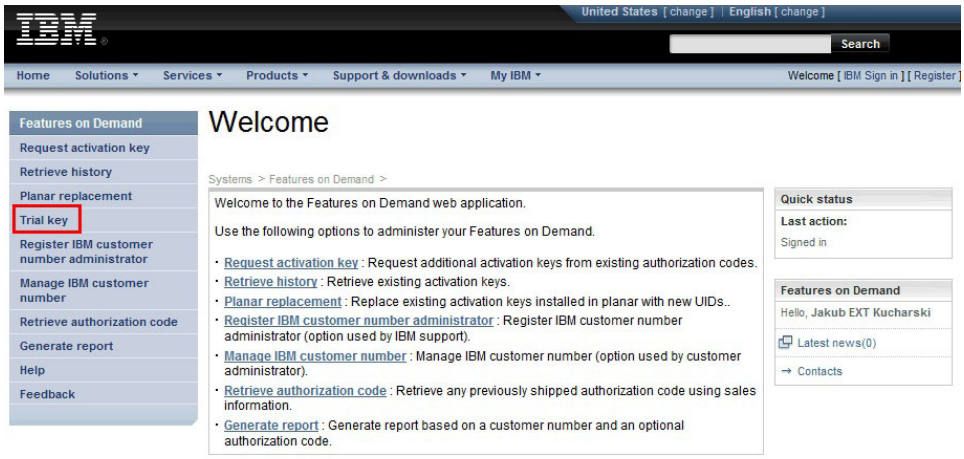


Using a trial key

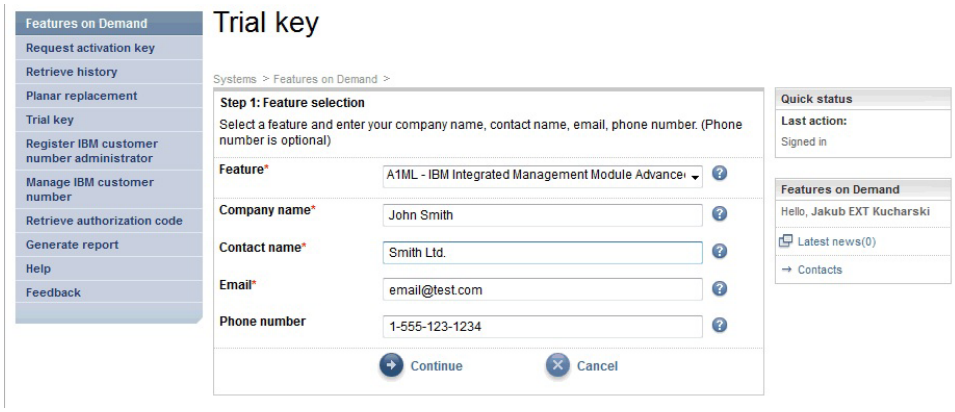
A Features on Demand trial key enables you to evaluate the benefits of a Features on Demand feature before purchase. The trial period is usually for 90 days. To purchase a feature, contact your IBM marketing representative or authorized reseller.

To activate a trial key, complete the following steps.

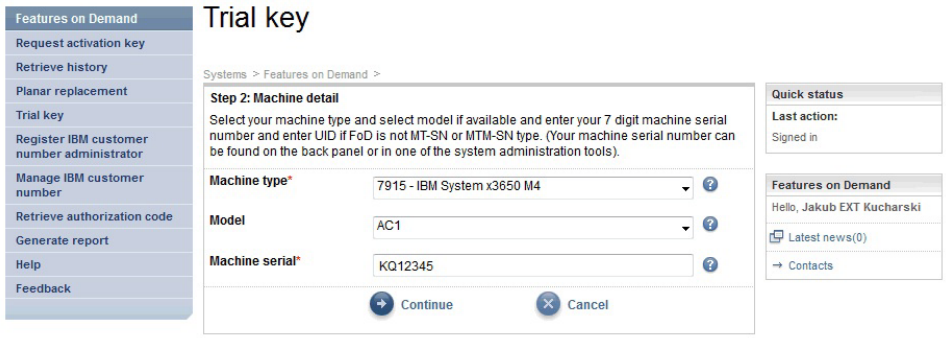
1. Go to http://www.ibm.com/systems/x/fod/ and log in to the Features on Demand website.
2. On the Welcome window, select **Trial key**.



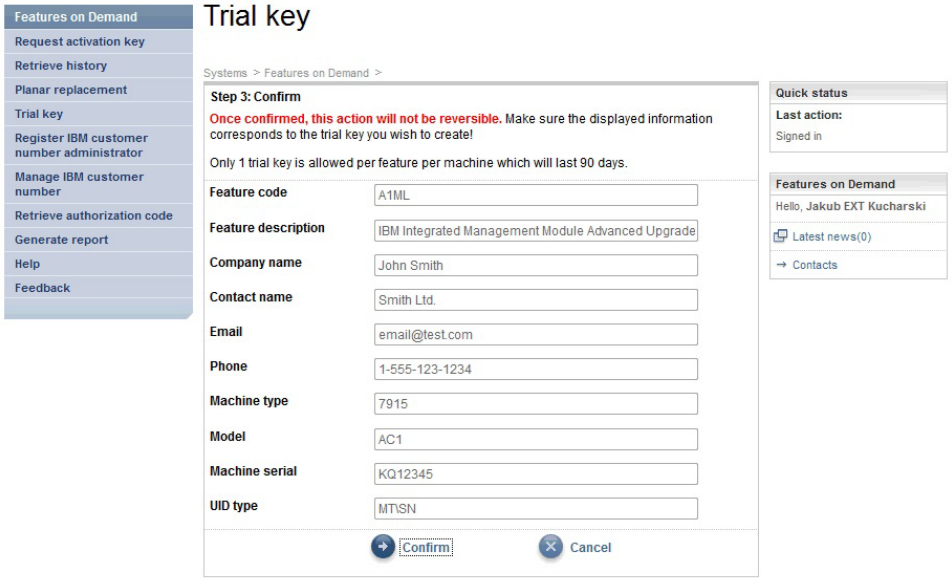
3. On the Trial key window, select a feature and enter your company name, contact name, email, and phone number (optional). Click **Continue**.



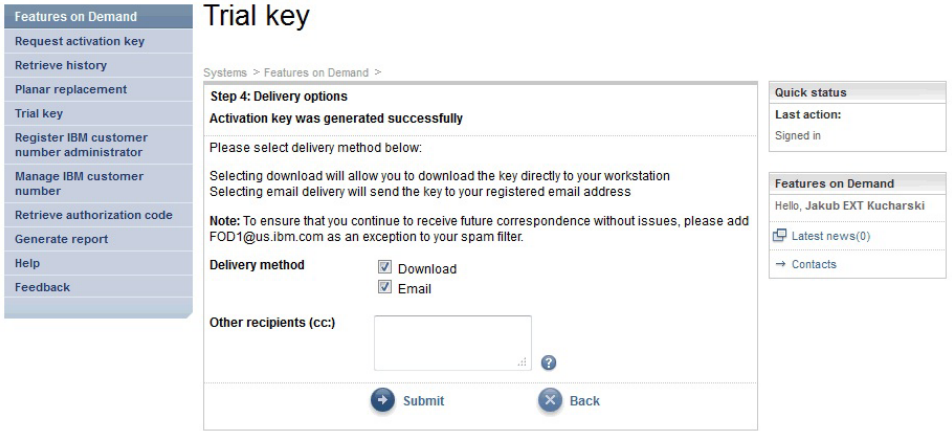
4. In the Trial key machine detail window, select the machine type and serial and click **Continue**.



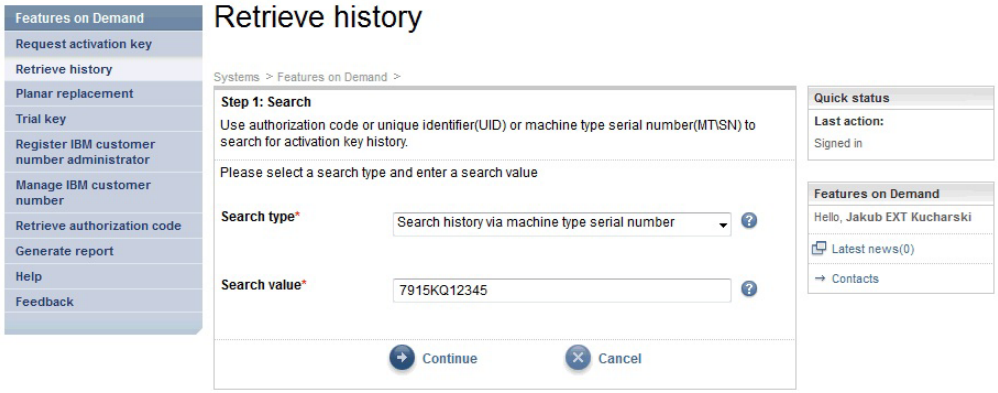
5. In the Trial key confirmation window, review the information and click **Confirm**. The action is not reversible after you click Confirm.



6. In the Trial key delivery options window, select the delivery method for which to receive the trial key, either download the key directly to your workstation or you can have the key sent to your registered email address.



You can also search for the trial key by selecting **Retrieve history** in the left navigation pane.



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 65.
- 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.

© Copyright IBM Corp. 2012, 2013

Manually installing a Features on Demand activation key on the IMM2

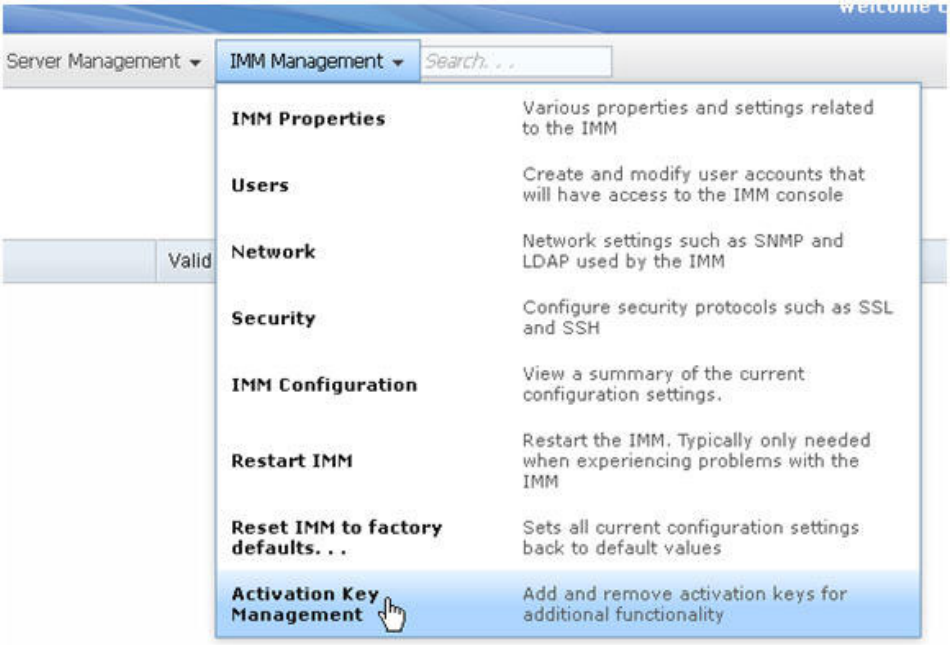
For a Features on Demand activation key that is stored in the IMM2, you can use the IMM2 web interface to manually install the Features on Demand activation key to activate the feature that you purchased. You can also use the IMM2 CLI `keycfg` command to display, add, or delete Features on Demand activation 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?lndocid=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*.

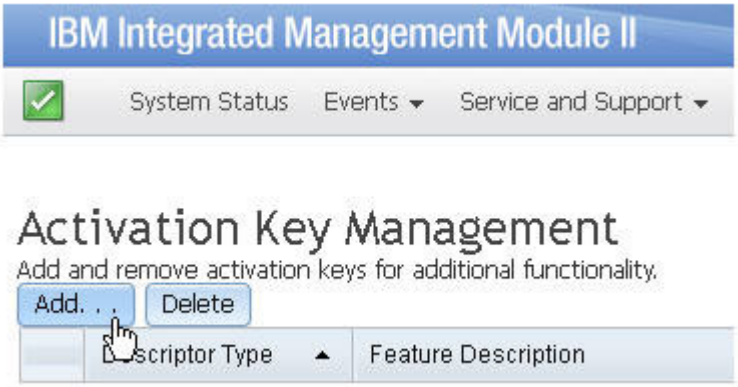
To manually install a Features on Demand by using the IMM2 web interface, complete the following steps:

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.

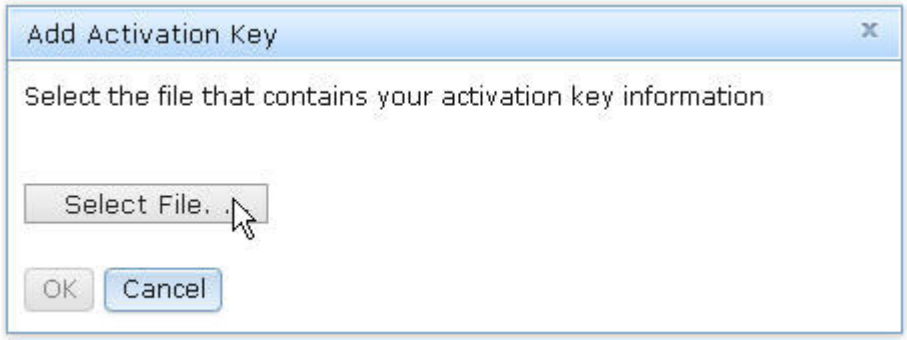
4. From the IMM2 web interface, click on the **IMM Management** tab; then click on **Activation Key Management**.



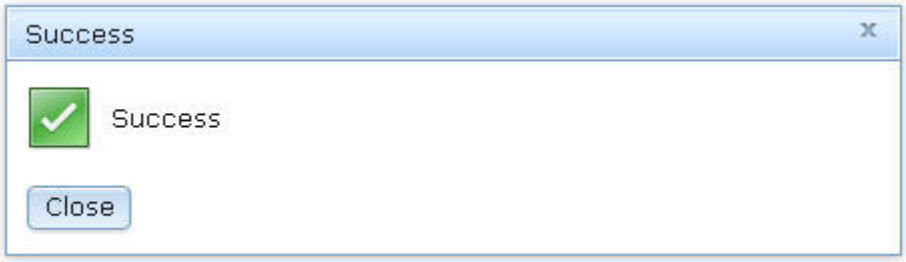
5. From the Activation Key Management page, click **Add**.



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.



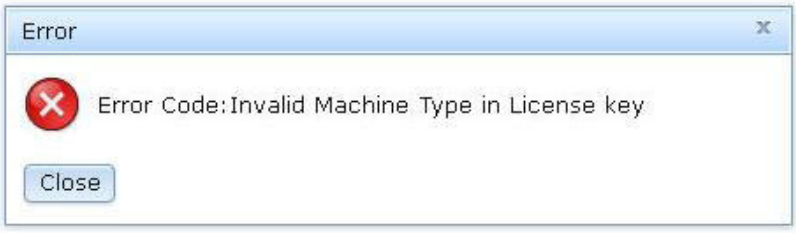
The Success window indicates that the activation key is installed correctly.



Notes:

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

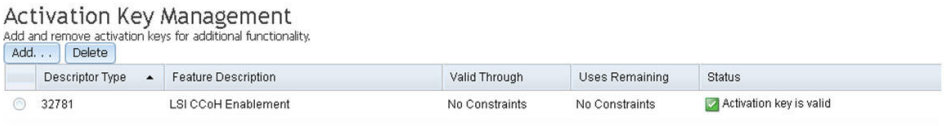
- If you are attempting to install the activation key on a machine type that does not support the Features on Demand feature, the following error window is displayed.



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.

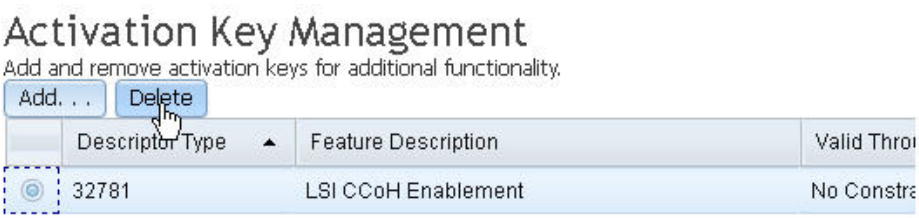


Manually removing a Features on Demand activation key on the IMM2

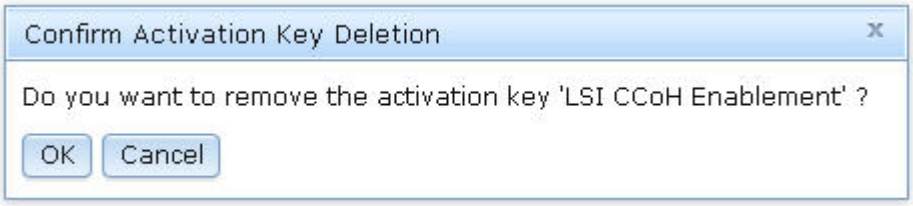
To remove a Features on Demand activation key, complete the following steps:

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**.



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?lndocid=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?lndocid=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

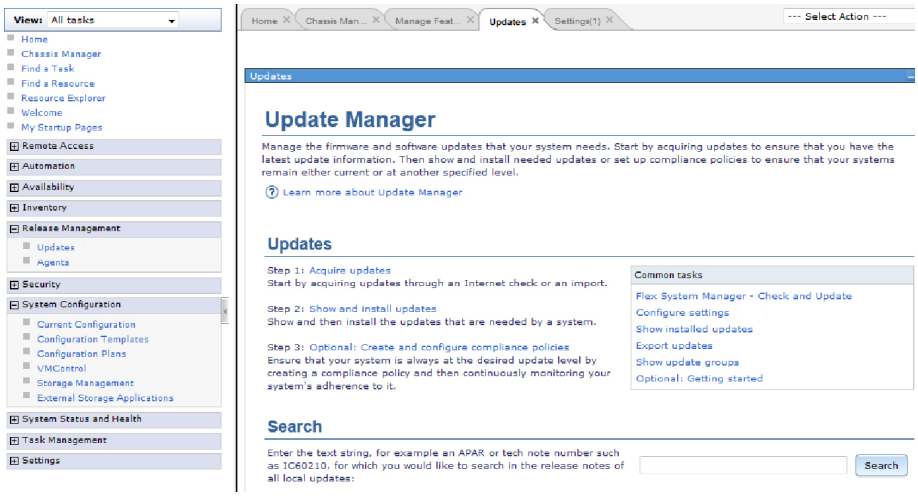
You must perform the following tasks before you retrieve or install Features on Demand activation keys on supported systems:

- 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:

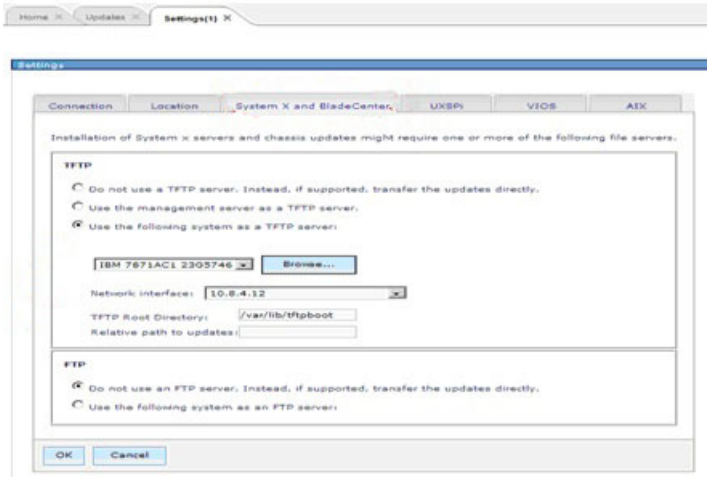
1. To configure the Trivial File Transfer Protocol (TFTP) server settings for the switch, complete the following steps. The TFTP server is used to inventory or install feature activation keys on the switch.
   a. From the left navigation pane, under **Release Management**, select **Updates**.
   b. On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



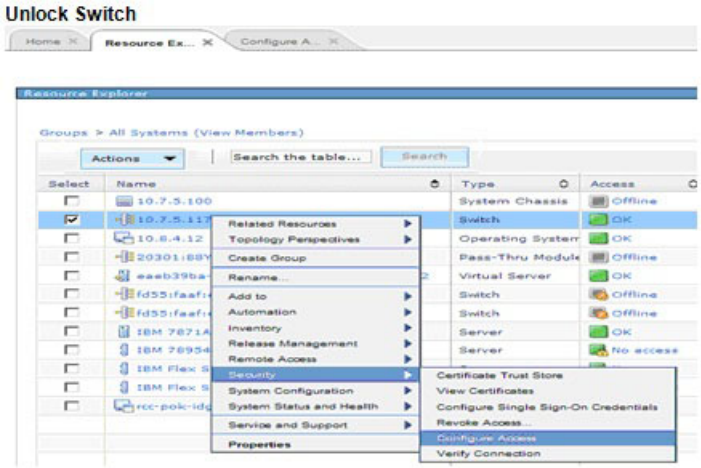
   c. On the Settings page, select **System x and BladeCenter**.

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.

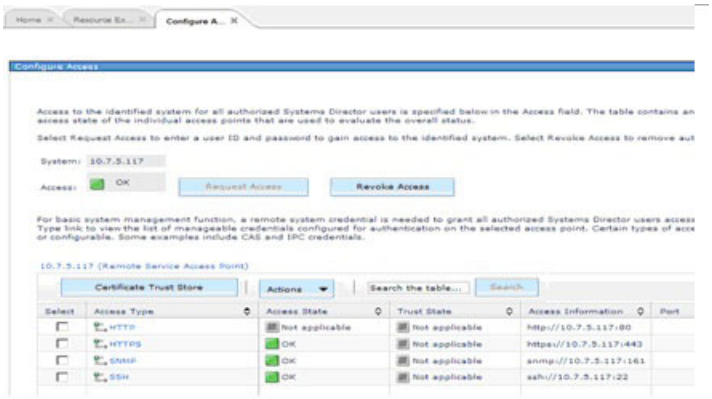
     Note: For IBM Flex System environments, you must use an external TFTP server.



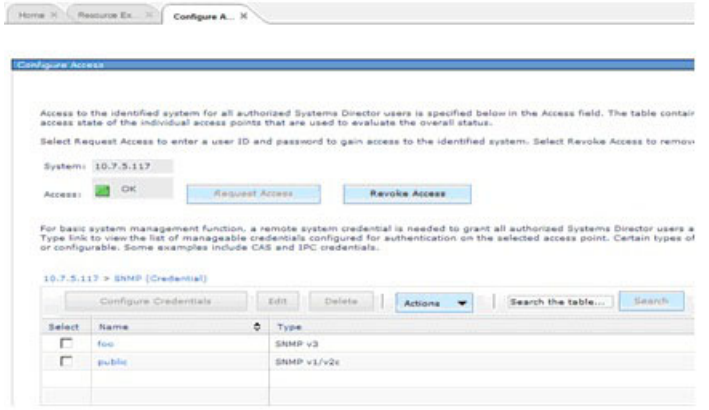
2. To enable either SNMPv1v2c or create an SNMPv3 user with privilege to manage key in the switch, complete the following steps:
   a. Select the **Resources Explorer** tab and on the Resources Explorer page, select the switch.
   b. Right-click on the switch and click **Security -> Configure Access**.



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



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.



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
    ```

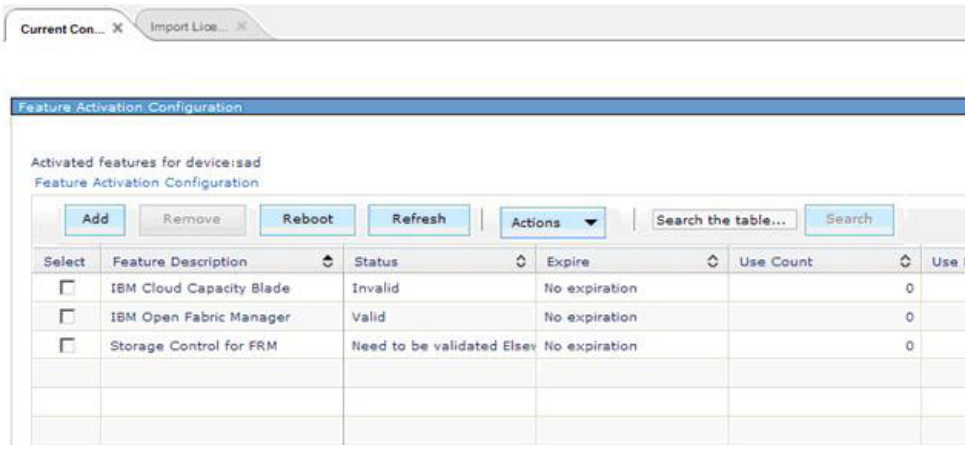
  - Location of the logs:

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

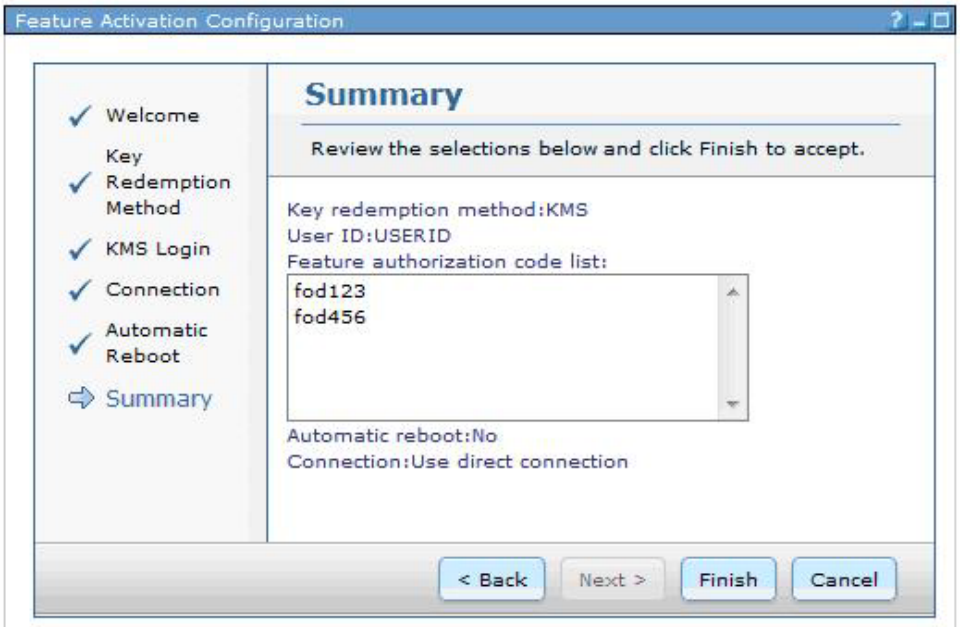
Using IBM Systems Director Feature Activation Manager

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

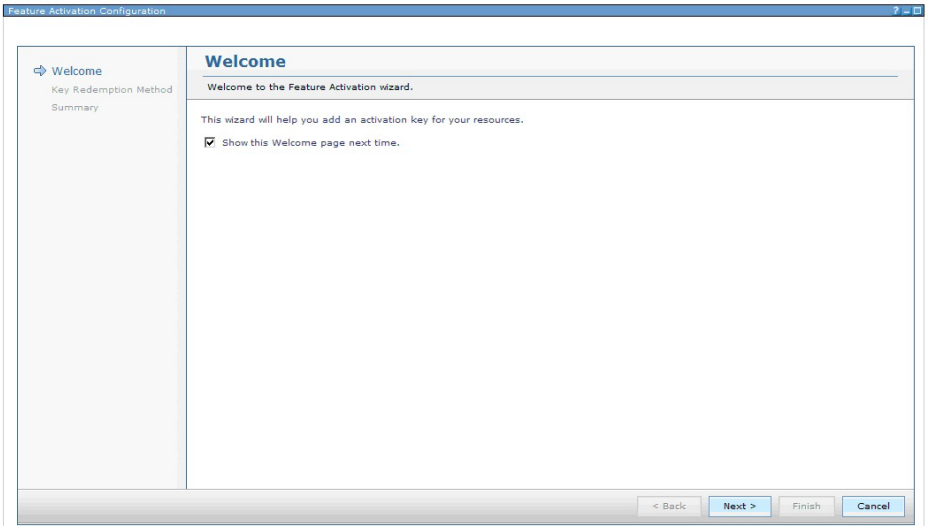
To retrieve a Features on Demand activation key, complete the following steps:

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.

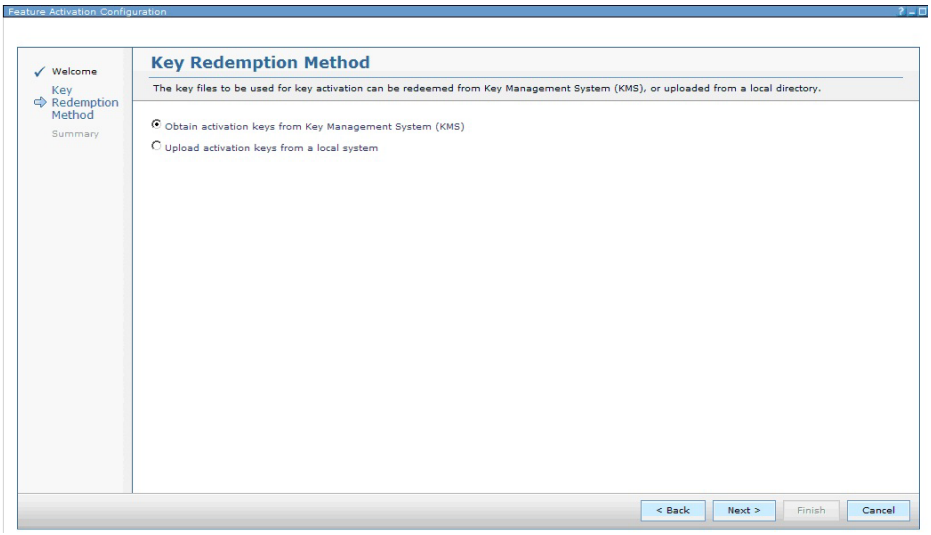
Creating a Feature Activation Manager template

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.

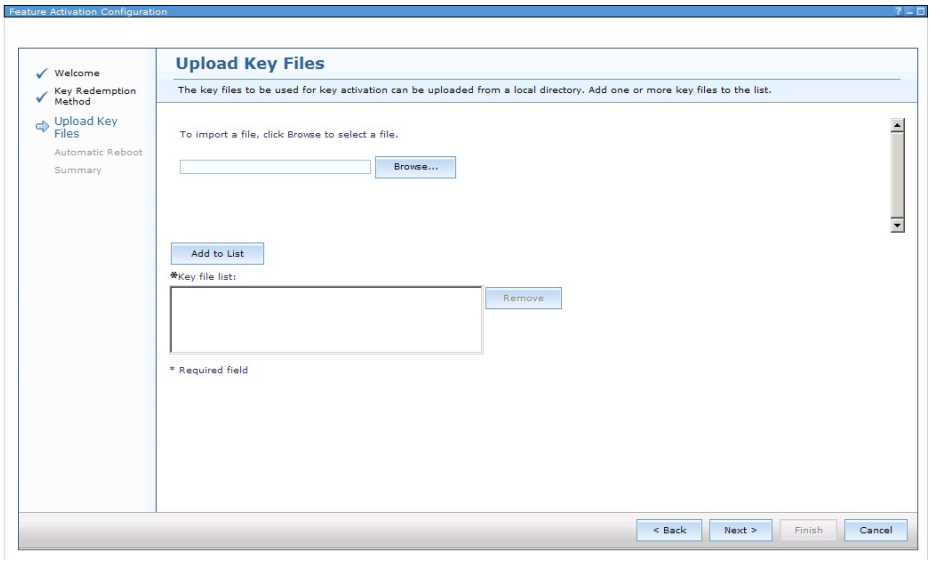


- Key Redemption Method page. On this page you can specify one of the following methods to use to obtain the activation keys that you want to configure:
  - **Obtain activation keys from Key Management System (KMS):** Requires that you log in to KMS and specify one or more feature authorization codes. 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.



- 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.

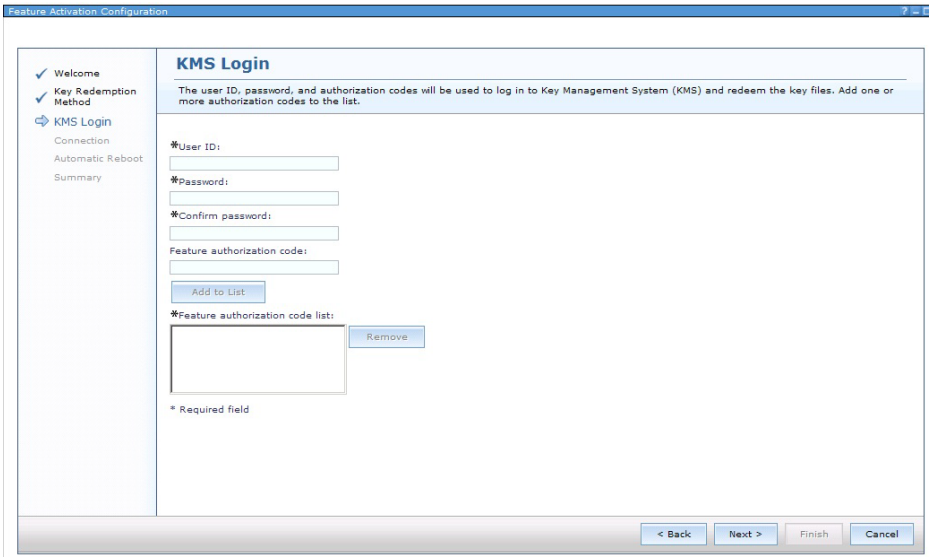
  To remove a file from the list, select the file that you want to remove and click **Remove**.



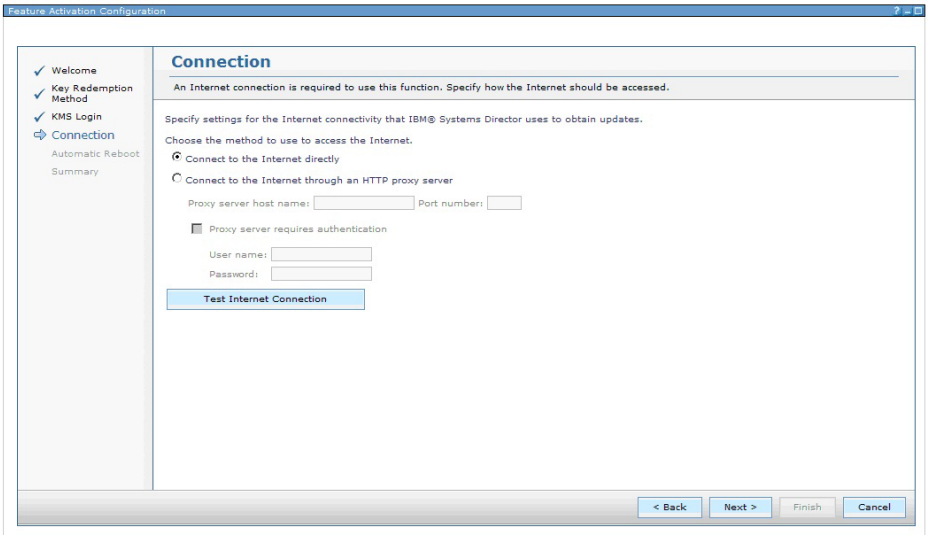
- KMS Login page. This page displays only if you choose to obtain activation keys from Key Management System (KMS). Specify the user ID and password that is required to log in to KMS, and then specify at least one feature authorization code.

  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.

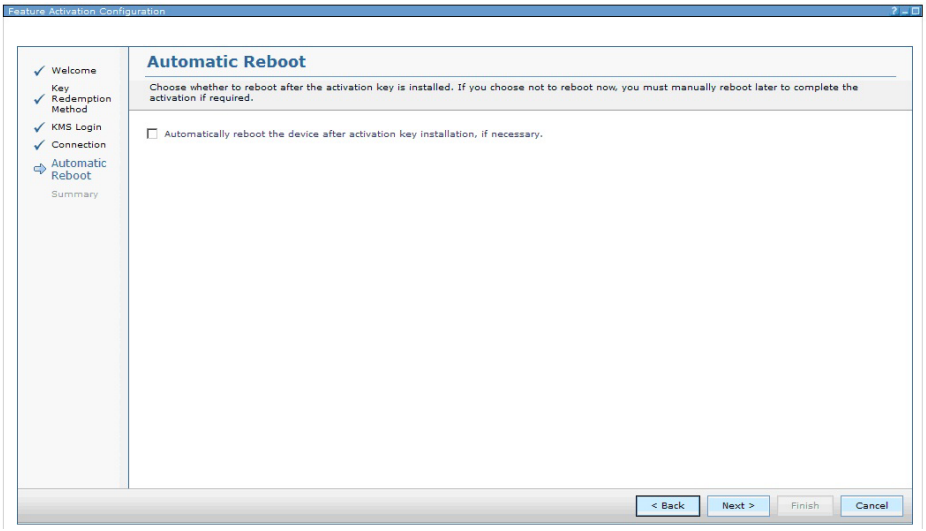
  To remove a feature authorization code from the list, select the code that you want to remove and click **Remove**.



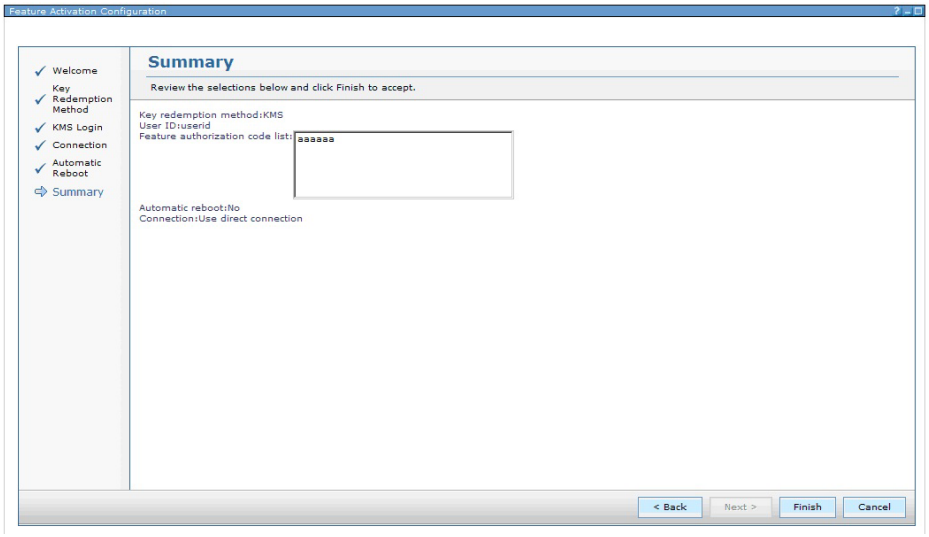
- Connection page. (This page displays only if you choose to obtain activation keys from KMS.) On this page you can specify how the management server accesses the Internet. You can choose direct connection or connection by proxy server. To connect through a proxy server, you must specify the proxy server 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.



- 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.



- 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.



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 36.
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 37 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:

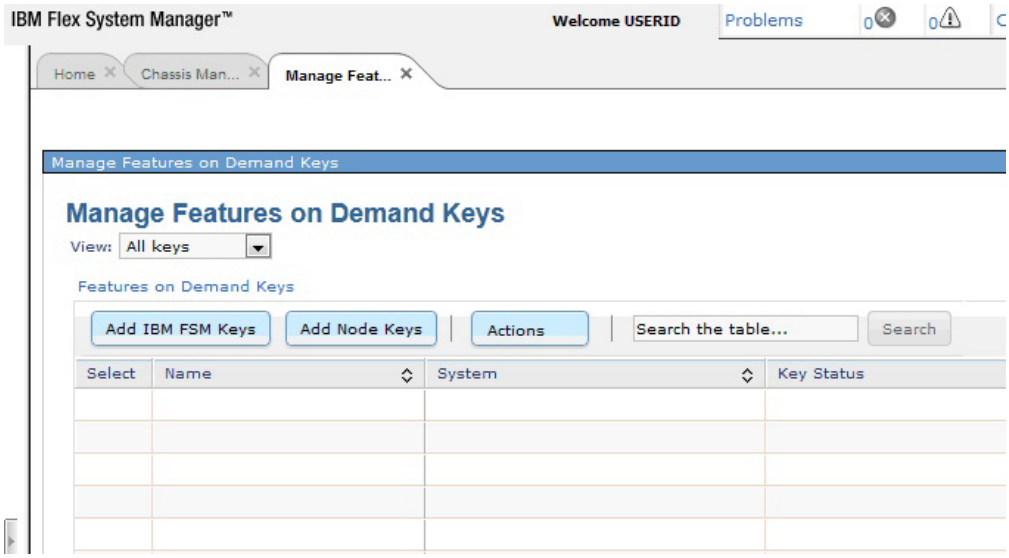
1. Follow the steps in “Creating a Feature Activation Manager template” on page 37.
2. Select **Feature Activation Manager Template** from the **Configuration Templates** table and click **Deploy**.
3. Select one or more systems and click **OK** to run the job immediately or go to the **Schedule** tab 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 37.

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
• 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	• 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 23.

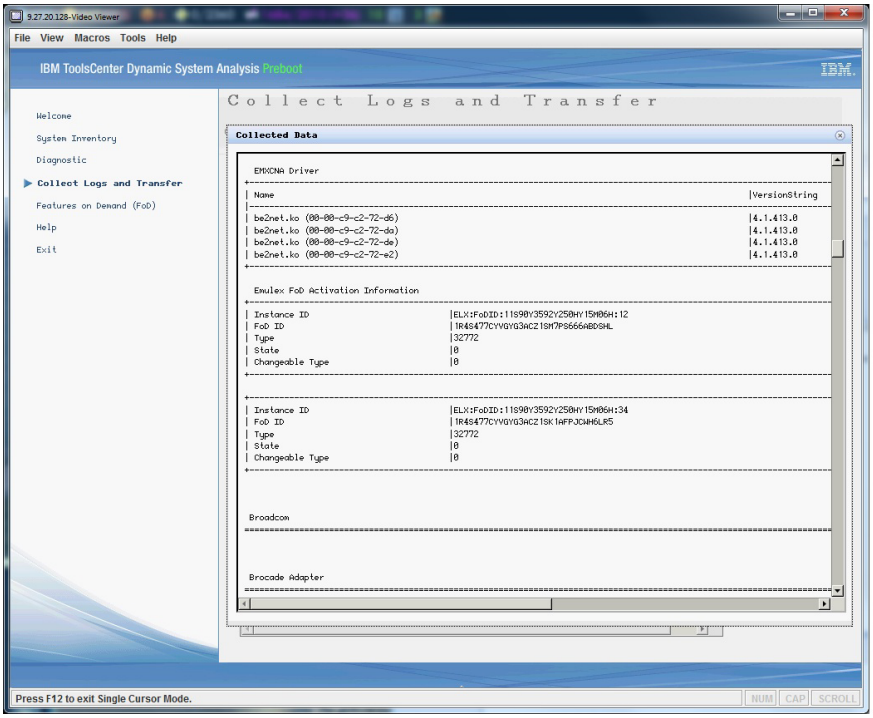
Getting the Emulex ASIC unique identifier

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.



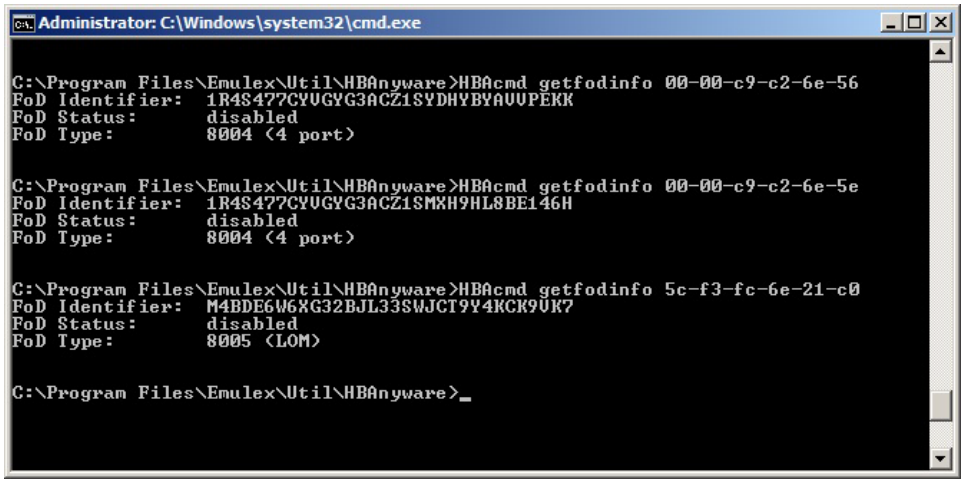
Using hbacmd utility to retrieve and display a unique identifier

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 utilty 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.



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. Backing up activation keys

NOTE TO REVIEWERS:
The information in this chapter came from the *Using IBM System x Features on Demand Redbook*.

This chapter describes the methods that you can use to either save activation keys or save the UID information about each IBM Features on Demand feature. You can use the following tools to back up the Features on Demand activation keys:

- Advanced Settings Utility (ASU)

  ASU exports the activation keys so that you can reinstall them, if necessary.
- IBM Dynamic System Analysis (DSA)

  DSA (both preboot and portable) exports only the UIDs, which makes it easier to download and reinstall them, if necessary.

Note: You cannot back up the activation keys using IMM2. The IBM Features on Demand activation keys do not form part of the IMM2 backup; therefore, it is not possible to back up the keys by using the IMM2 hardware.

Backing up feature activation keys by using ASU

You can use the IBM Advanced Settings Utility (ASU) to export feature activation keys from the IMM2 for backup purposes. The activation keys can be exported to the following locations:

- The local operating system that runs on the IMM2-based server. The system must have the ASU installed locally.
- A remote system with ASU installed locally.

For more information if you are not familiar with using the ASU, go to http://www-947.ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5085890.

You can download the ASU at http://ibm.com/support/entry/portal/docdisplay?lndocid=TOOL-ASU.

Exporting all activation keys from the local IMM key repository

NOTE TO REVIEWERS:
Please help rewrite the last sentence in the first paragraph that begins with "Do not disable LAN over USB..." It does not make sense to me.

Before you begin, make sure that you have downloaded the correct version (32-bit or 64-bit) of the ASU for the server operating system on which it is running. Do not disable LAN over USB on the IMM because ASU uses this feature to communicate with it to apply to export the activation key.

To export all activation keys from the local IMM key repository and then save them locally, type the following ASU command and parameters:

```
asu64.exe fodcfg exportkey -d directory --keyid all --user username
--password password
```

© Copyright IBM Corp. 2012, 2013

where *directory* is the location of the directory to which the Features on Demand keys are exported, *username* is an IMM2 administrative account, and *password* is the password of the selected IMM2 administrative account.

Note: You do not need to specify a user name and password in the command if the IMM2 is using default credentials (USERID/PASSW0RD). The ASU attempts to use the default IMM2 authentication credentials if none are specified in the command. Also note that if an export directory is not specified, the ASU exports the keys to the directory from which it is run.

Command example

The following setup information is used in the command example:

- An ASU 64-bit version is installed on a 64-bit Microsoft Windows Server-based operating system.
- The local directory containing the ASU is `C:\ASUtil`.
- The local directory to export the Features on Demand keys is `C:\fodkey`.
- The IMM user name is `USERID`.
- The IMM password is `iloveitso`.

Using the setup information, the command is:

```
C:\ASUtil>asu64.exe fodcfg exportkey -d c:\fodkey --keyid all --user USERID
--password iloveitso
```

If you receive the `Succeeded exporting key` message followed by an activation key name, the command completed successfully.

The following example output shows that two activation keys have been exported successfully to the directory specified in the command.

```
IBM Advanced Settings Utility version 9.21.78C
Licensed Materials - Property of IBM
(C) Copyright IBM Corp. 2007-2012 All Rights Reserved
No host specified, attempting to discover the IMM(s) via SLP.
Successfully discovered the IMM via SLP.
Pegasus Exception: Cannot connect to 169.254.95.118:5989. Connection failed.
Executing the command through CIM interface failed, trying IPMI interface.
Connected to IMM at IP address 169.254.95.118
Succeeded exporting key ea6f0962f921c0b9.
Succeeded exporting key 3c08174de28098bb.
```

Exporting all activation keys from a remote IMM key repository

NOTE TO REVIEWERS:
Please check the use of the word "local" in this section. I think the word "remote" should be used in some cases, but I copied what was in the Redbook.

Before you begin, make sure that you have downloaded the correct version (32-bit or 64-bit) of the ASU for the workstation on which it is running.

To export all activation keys from the local IMM key repository and then save them locally, type the following ASU command and parameters:

```
asu.exe fodcfg exportkey -d directory --keyid all --host ipaddress --user username
--password password
```

where *directory* is the location of the directory to which the Feature on Demand keys are exported, *ipaddress* is the IP address of the IMM2 on the remote server, *username* is an IMM2 administrative account, and *password* is the password of the selected IMM2 administrative account.

Note: You do not need to specify a user name and password in the command if the IMM2 is using default credentials. The ASU attempts to use the default IMM2 authentication credentials if none are specified in the command. Also note that if an export directory is not specified, the ASU exports the keys to the directory from which it is run.

Command example

The following setup information is used in the command example:

- An ASU 64-bit version is installed on a 64-bit Microsoft Windows-based workstation.
- The local directory containing the ASU is `C:\ASUtil`.
- The local directory to which to export the Features on Demand keys is `C:\fodkey`.
- The IMM user name is `USERID`.
- The IMM password is `iloveitso.`

Using the setup information, the command is:

```
C:\ASUtil>asu.exe fodcfg exportkey -d C:\fodkey --keyid all --host 9.42.171.39
--user USERID --password iloveitso
```

If you receive the message `Succeeded exporting key` followed by an activation key name, the command completed successfully.

The following example output shows that two activation keys have been exported successfully to the directory specified in the command.

```
IBM Advanced Settings Utility version 9.21.78C
Licensed Materials - Property of IBM
(C) Copyright IBM Corp. 2007-2012 All Rights Reserved
Pegasus Exception: Cannot connect to 9.42.171.39:5989. Connection failed.
Executing the command through CIM interface failed, trying IPMI interface.
Connected to IMM at IP address 9.42.171.39
Succeeded exporting key ea6f0962f921c0b9.
Succeeded exporting key 3c08174de28098bb.
```

Note: The activation keys that are exported have file names that are associated with a key ID used in ASU. You can use the `asu fodcfg reportkey` command to see the key ID information.

Store these key files in a safe location. If you replace the system board of the server, you can use the ASU command to reapply the key files.

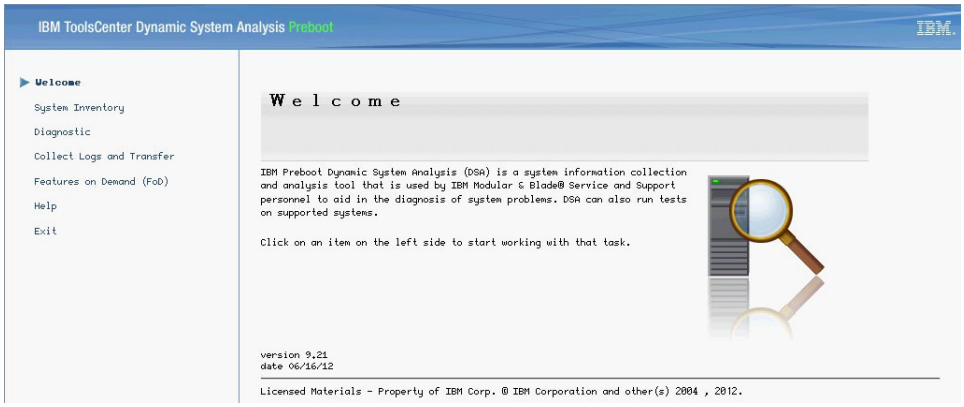
Backing up Features on Demand UIDs by using Preboot DSA

This section describes how to back up Features on Demand unique IDs (UIDs) to a removable media device, such as a USB memory key, by using the Preboot DSA graphical interface. The Preboot DSA command-line tool (CLI) is also available in DSA as a restore method.

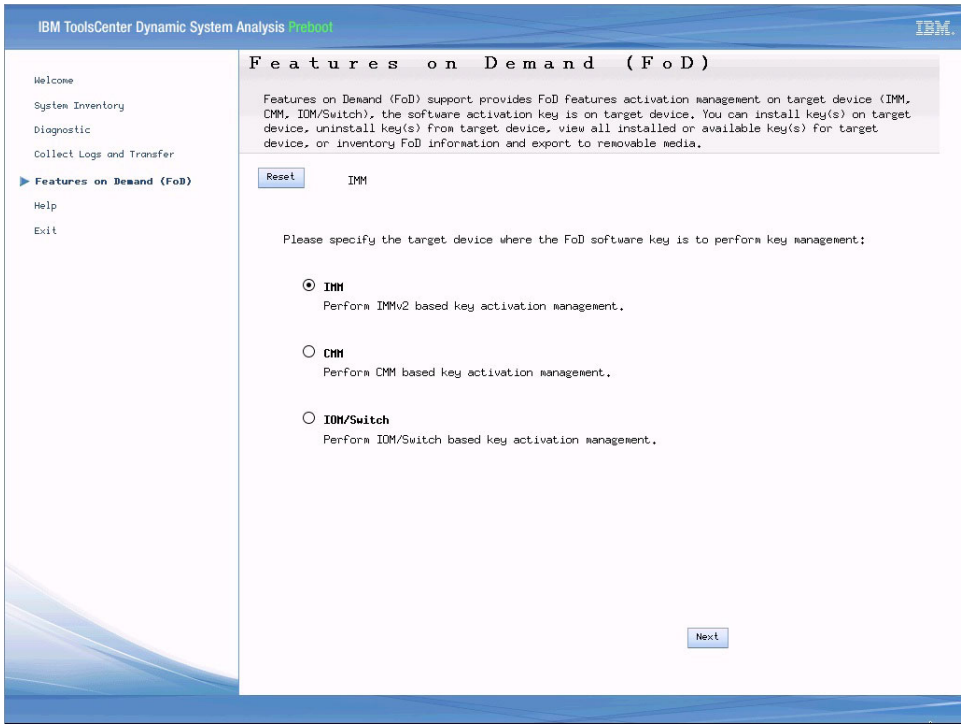
Note: Unlike ASU, Preboot DSA does not back up activation keys. Preboot DSA can back up only Features on Demand UIDs.

To back up the UIDs that are installed in a server, complete the following steps:

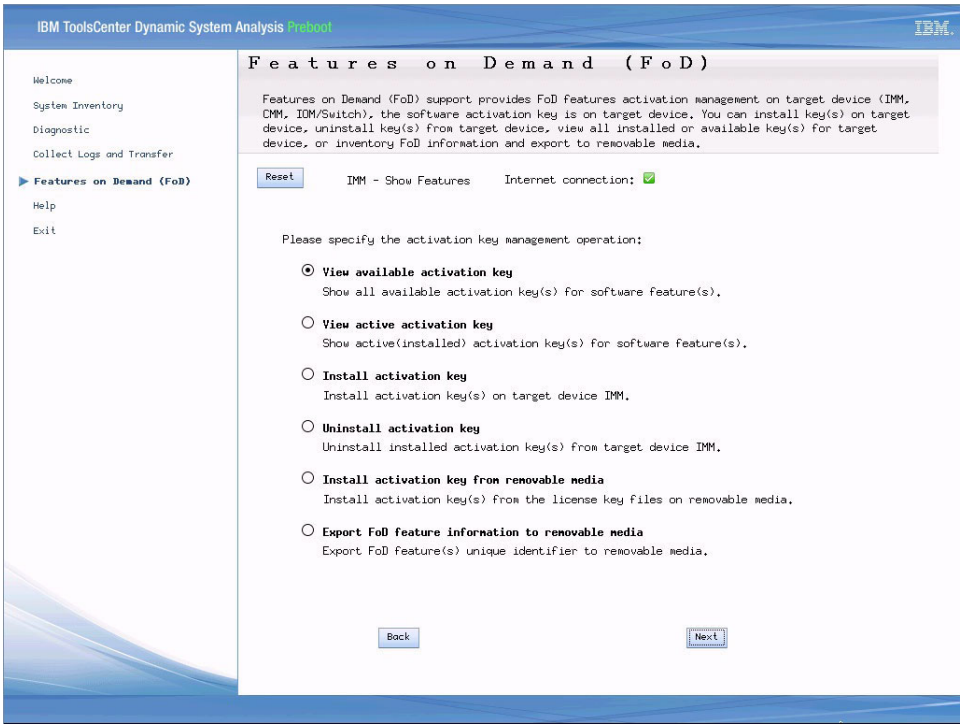
1. Start the server to Preboot DSA and select **Features on Demand (FoD)** from the left navigation pane.



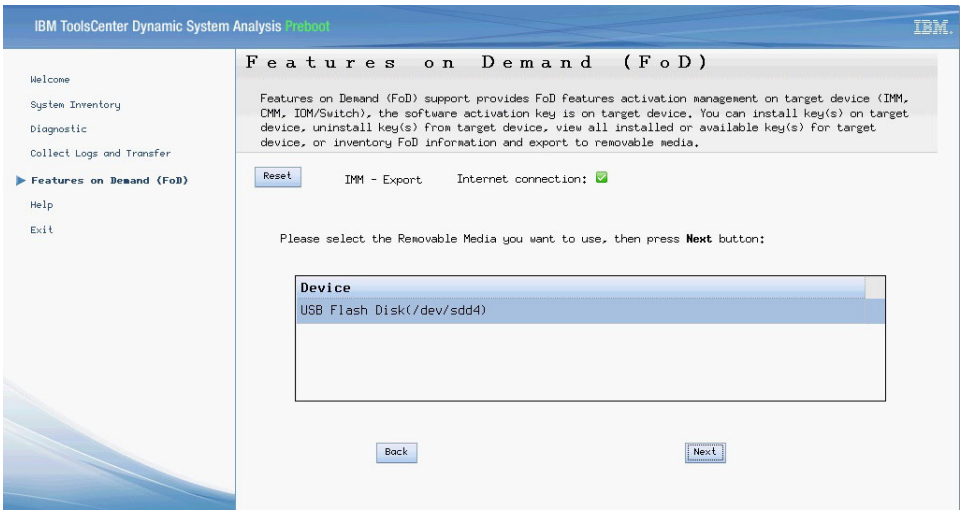
2. Specify a target device, for example, select **IMM**; then, click **Next**.



3. Select **Export FoD feature information to removable media**.



4. Click **Next** after selecting available removable media.



5. The next window shows the available key information to export. Keys that are identified as valid can be exported. Keys that are labeled as N/A are installed, but the IMM is unable to determine the current status of them (for example, whether or not the hardware using the keys is present and using the keys).

6. After the files are exported, the Features on Demand information is stored in the `dsa_fod_id.txt` file in the root directory of the removable media.

Backing up Features on Demand UIDs by using Portable DSA

This section discusses how to run portable DSA to export UIDs.

The DSA command is issued from a command line on the server and it assumes an operating system is installed. The following command exports all Features on Demand UIDs on the local system and stores them locally in the DSA output folder in the `dsa_fod_id.txt` file:

```
dsaexe fod export_imm_uid
```

The command displays the following output:

```
Querying FoD unique ID... Done!
Exporting the local FoD unique id(s)...
FoD unique IDs are exported as file: C:\IBM_Support\dsa_fod_id.txt
Please press ANY key to Continue ...
```

Note: At the time this document was written, DSA exports the Features on Demand UIDs only on the local system to the local directory.

Chapter 5. Reactivating Features on Demand keys

This chapter explains how to reactivate Features on Demand keys after you replace a system board or other device.

Replacing a system board

Important: The customer is responsible for reactivating Features on Demand keys after a hardware 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 are restored to their original values. Most Features on Demand activation keys are associated with the machine type and serial number and do not work if the system machine type and serial number are changed. For more information about restoring the VPD information, see the system *Problem Determination and Service Guide*.
- Periodically run the tools described in Chapter 4, “Backing up activation keys,” on page 49 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 if the system board fails, you have the key information readily available.
- If the system board is replaced and the VPD data is restored to the original values, you can import the existing activation keys.

Reactivating server-based or chassis-based keys (machine type and serial number)

To reactivate IBM Features on Demand features and upgrades for server-based or chassis-based keys, for example, ServeRAID, Intel Ethernet, and IMM keys, but excluding Emulex keys, complete the following steps:

1. Use the IBM Features on Demand website and the Retrieve History function to download all keys that are associated with the server. You must specify the server UID, which is a concatenation of the machine type and serial number (for example, 7160KQ5N05V). For more information, see “Retrieving history” on page 13.
2. Reapply the keys to the server by using the IMM2 web interface or tools such as ASU or DSA. For more information, see “Using IBM ToolsCenter utilities to manage Features on Demand activation keys” on page 29.

© Copyright IBM Corp. 2012, 2013

Reactivating keys for UIDs that are not based on the machine type and serial number

Use the information in the following sections to reactivate keys for UIDs that are not based on the machine type and serial number.

For a device that is not integrated on the damaged system board

To reactivate a key for a controller or device that is not integrated on the system board, but that has a UID that is not based on the machine type and serial number of the server (for example, an Emulex controller), complete the following steps:

1. After you reinstall the controller on the replacement system board, use the Emulex tools (for example, Emulex OneCommand Manager or HbaCmd) to determine the UID (or both UIDs in the case of the IBM Flex System CN4054 adapter) of the Emulex controller.
2. Use the Retrieve History function on the IBM Features on Demand website to download the key associated with the Emulex UID. For more information, see "Retrieving history" on page 13.
3. Reapply the key to the server using the IMM2 web interface or tools such as the ASU or DSA. For more information, see "Using IBM ToolsCenter utilities to manage Features on Demand activation keys" on page 29.

For a damaged device or a controller that is integrated on the damaged system board

You can use the "Planar replacement" function on the Features on Demand website to reset a unique identifier (UID) for one or more active Features on Demand activations. Only UIDs that are not the machine type and serial number can be reset by using the "Planar replacement" function. You can reset the UID for an integrated controller on a replaced system board or for any of the following devices after they are replaced:

- IBM switch
- Brocade switch
- Mellanox switch
- Emulex expansion card

When you replace the server system board (planar), the controller UID on the replacement system board will be different, and a replaced switch that is installed in a chassis will have a different serial number.

Note: You can reset the UID by using the Planar replacement function only three times for each key that is installed in a particular machine type and serial number. If you receive the `Some key(s) exceed 3 times replacement limit` 5080 error message, send an email to fod@us.ibm.com. For more information, see Chapter 7, "How to get help with Features on Demand," on page 63.

To reset a UID for a switch or an integrated controller, complete the following steps:

1. Record the new UID of the replaced IBM switch or integrated device on the replaced system board. You will need the new UID later in the procedure. See the documentation that comes with the switch or device for information about how to obtain the new UID.

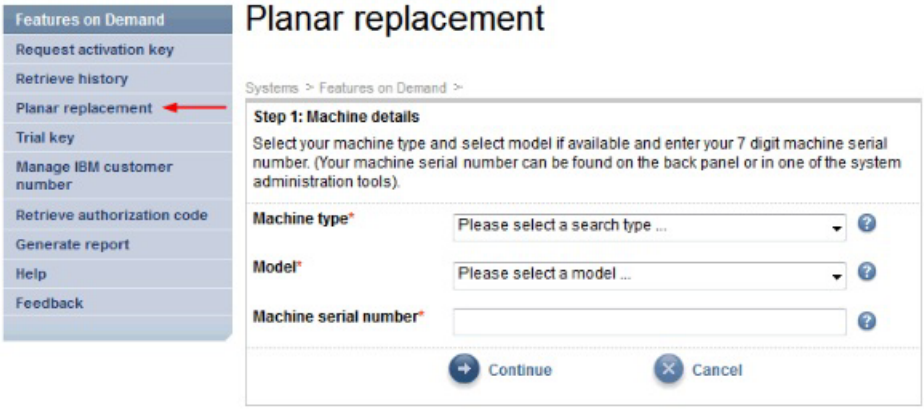
   Note: For an Emulex controller that is integrated on the system board, use the Emulex tools (for example, Emulex OneCommand Manager or HbaCmd) to determine the UID of the Emulex controller on the replacement system board.

   For more information about replacing a system board with an integrated Emulex controller, see RETAIN® tip H205574 at http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5090088.
2. Go to http://www.ibm.com/systems/x/fod/ and sign in.
3. To confirm that your current Features on Demand activations are available on the Features on Demand website, select **Retrieve history** on the left navigation pane; then, select a search type, enter a search value, and click **Continue**. The activation keys generated and installed in the machine type and serial number that you entered are displayed.

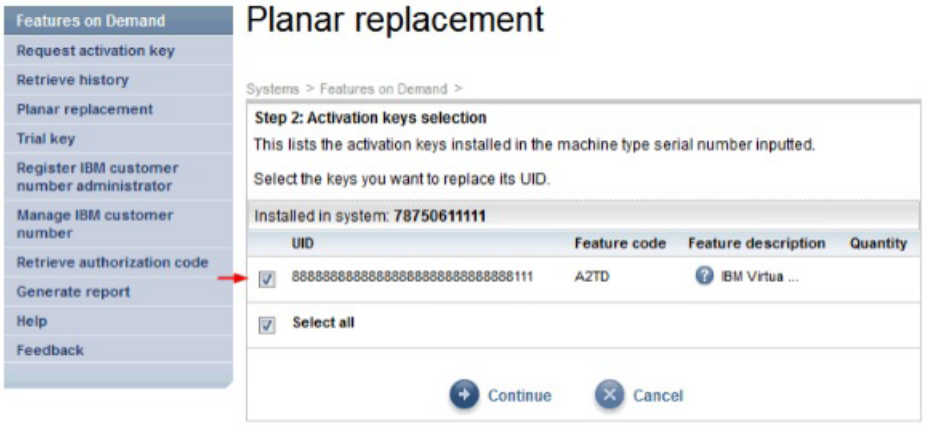
   Note: On the Retrieve history results page, if you only see a “Generated for” section, the features that are displayed will work correctly without a UID reset because their activation is associated with the machine type and serial number of your system or chassis. If a replacement is required, the new system or chassis will keep the same machine type and serial number as your current system.

   The following illustration shows the results of a search on a Retrieve history page. The activation keys that are installed in a system are displayed.

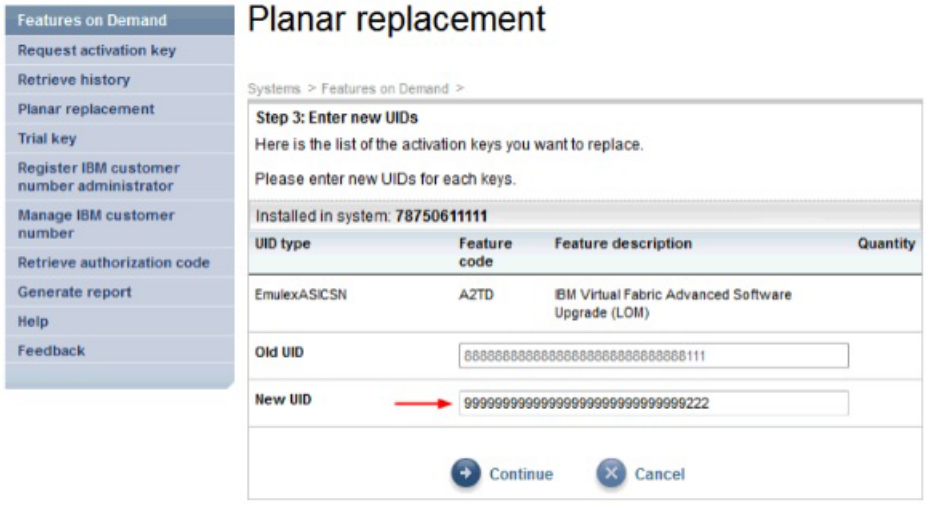
4. From the left navigation pane, select **Planar replacement**, then, select the machine type and model, and enter the 7-digit serial number. Click **Continue**.



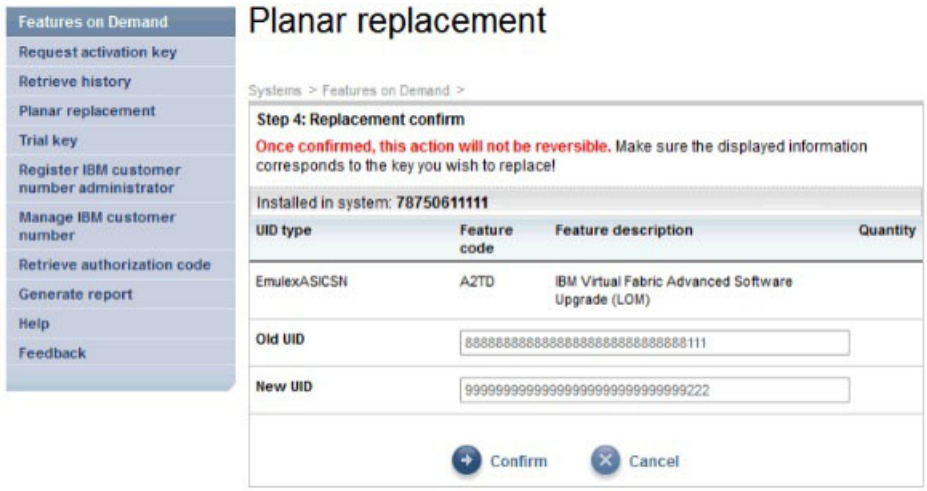
5. Select the activation keys that must be reset and select **Continue**. (For example, if you have two IBM switches and one fails, only the switch that failed must be selected.)



6. Enter the new UID that you recorded in step 1 on page 57 and select **Continue**.

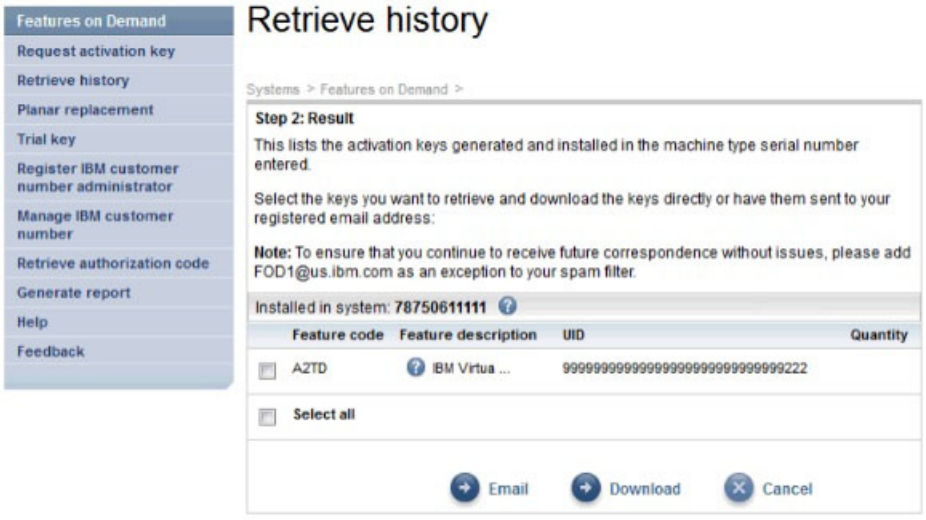


7. In the Replacement confirm window, click **Confirm**.



8. The new activation keys are generated and you can view them on the **Retrieve history** page. The old activation keys are no longer available.

9. To download the new activation keys, on the left navigation pane, select **Retrieve history**, select the search type and enter the search value, and click **Continue**. The activation keys that are installed in the machine type and serial number that you selected are displayed.



10. Select the new activation keys and click **Email** or **Download**.
11. Reapply the key to the server using the IMM2 web interface or tools such as the ASU or DSA. For more information, see “Using IBM ToolsCenter utilities to manage Features on Demand activation keys” on page 29.

Replacing an adapter

Important: The customer is responsible for reactivating Features on Demand keys after a hardware replacement.

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 a 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, you can reset the UID by using the Planar replacement function on the Features on Demand website. For more information, see “For a damaged device or a controller that is integrated on the damaged system board” on page 56 in the section “Reactivating keys for UIDs that are not based on the machine type and serial number” on page 56.

Moving an adapter or controller

If you move an adapter with IBM Features on Demand features enabled to a new server, the Features on Demand features do not transfer to the new server. Contact IBM support and open a request to get the Features on Demand entitlements transferred to the UID (machine type and serial number concatenated) of the new server.

If you are using a ServeRAID controller with boot drives and IBM Features on Demand features on the controller, if the Features on Demand features are not reenabled after you move the controller, the server might not start correctly.

For example, if you have a ServeRAID M5110 controller and have enabled RAID 6 through an IBM Features on Demand upgrade, and then you move the controller and drives to a new server, the drives will not boot. Instead, you will see the following error message:

```
The native configuration is no longer supported by the current controller
settings. Please ensure that correct controller, ibutton or key-vault is being
used. If you continue the configuration will be marked as foreign and part of it
may be imported if possible.
```

In this case, contact IBM support and get a new authorization code or activation key to enable RAID 6 on the controller in the new server.

Chapter 6. Troubleshooting

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

Table 4. Features on Demand troubleshooting

Sympton	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 *Problem Determination and Service Guide* 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 *Problem Determination and Service Guide* 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 *User Guide* 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.

© Copyright IBM Corp. 2012, 2013

Chapter 7. 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

© Copyright IBM Corp. 2012, 2013

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 Demnad 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/protocl in URI."
    REVISION    "201202021538Z"           --2 February 2012
    DESCRIPTION
            "Added return code definition for device still
```

© Copyright IBM Corp. 2012, 2013

```
        performing key action requirested 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
```

Appendix B. Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION “AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM websites are provided for convenience only and do not in any manner serve as an endorsement of those websites. The materials at those websites are not part of the materials for this IBM product, and use of those websites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Trademarks

IBM, the IBM logo, and ibm.com are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the web at “Copyright and trademark information” at http://www.ibm.com/legal/copytrade.shtml.

Adobe and PostScript are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries.

© Copyright IBM Corp. 2012, 2013

Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc., in the United States, other countries, or both and is used under license therefrom.

Intel, Intel Xeon, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows, and Windows NT are trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Important notes

Processor speeds indicate the internal clock speed of the microprocessor; other factors also affect application performance.

CD drive speeds list the variable read rate. Actual speeds vary and are often less than the maximum possible.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for approximately 1000 bytes, MB stands for approximately 1 000 000 bytes, and GB stands for approximately 1 000 000 000 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity may vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard disk drive bays with the largest currently supported drives available from IBM.

Maximum memory might require replacement of the standard memory with an optional memory module.

IBM makes no representation or warranties regarding non-IBM products and services that are ServerProven®, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. These products are offered and warranted solely by third parties.

IBM makes no representations or warranties with respect to non-IBM products. Support (if any) for the non-IBM products is provided by the third party, not IBM.

Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.

Index

A

activating features using the website 8
activation key
  managing using IBM Flex System Manager 43
  managing using IBM Systems Director 31
  managing using IBM ToolsCenter 29
  manually installing 24
  manually removing 27
activation keys
  backing up 49
adapter replacement guidelines 60
Advanced Settings Utility, using 29
attention notices 4

B

backing up activation keys 49

D

Dynamic System Analysis, using 30

E

Emulex VFA activation key process
  feature upgrades 47
  getting unique identifier 44
  overview 44
  using hbacmd utility 46
  using pbDSA utility 45

F

feature activation 23
Feature Activation Manager (Systems Director)
  creating a template 37
  retrieving activation key 36
  starting user interface 36
  using 35
Features on Demand
  adapter replacement guidelines 60
  backing up activation keys 49
  Emulex VFA activation key process 44
  feature type tools 2
  getting help 63
  managing 3
  managing activation keys using IBM Systems Director 31
  managing activation keys using IBM ToolsCenter 29
  managing using IBM Flex System Manager 43
  manually installing activation key on IMM2 24
  manually removing activation key on IMM2 27
  MIB 65
  overview 2
  system board replacement 55
  system feature activation 23
Features on Demand *(continued)*
  system requirements 3
  troubleshooting 61
Features on Demand website
  activating features 8
  generating a report 18
  managing the IBM customer number 15
  registering with IBM 5
  retrieving an authorization code 17
  retrieving history 13
  using 5
Flex System Manager, using to manage activation keys 43

G

generating a report using the website 18
getting help 63

H

hbacmd utility, using 46

I

IBM Flex System Manager, using to manage activation keys 43
important notices 4
installing activation key
  deploy template 42
  on demand 42

M

managing activation keys
  using IBM Flex System Manager 43
  using IBM Systems Director 31
  using IBM ToolsCenter 29
managing Features on Demand features 3
managing the IBM customer number using the website 15
manually installing activation key on IMM2 24
manually removing activation key on IMM2 27
MIB 65

N

notes 4
notes, important 72
notices 71
notices and statements 4

O

overview of Features on Demand 2

© Copyright IBM Corp. 2012, 2013

P

pbDSA utility, using 45
portable DSA, using 30
preboot DSA, using 30

R

registering with IBM 5
replacing
  adapter 60
  system board 55
retrieving an authorization code using the website 17
retrieving history using the website 13

S

statements and notices 4
switches
  tasks to perform before installing or adding activation keys 32
system board replacement 55
system feature activation 23
system requirements 3
Systems Director Feature Activation Manager, prerequisite tasks before using 32
Systems Director, using to manage activation key
  Feature Activation Manager 35
  for switches 32
  overview 31
  prerequisite tasks 32

T

tools, feature type 2
ToolsCenter, using to manage activation key 29
trademarks 71
troubleshooting
  adapter replacement 60
  symptoms and causes 61
  system board replacement 55

W

website, using 5

Part Number: 00D2411

Printed in USA

(1P) P/N: 00D2411