

Intel On Demand

Overview, enablement, and troubleshooting

Lenovo

Overview of Intel On Demand

Intel On Demand implements software-defined silicon (SDSi) features on certain 4th Generation Intel Xeon Scalable processors and is available via Lenovo license. The licenses enable customers to activate embedded accelerators and increase the SGX Enclave size in supported processor models as their workload and business needs change.

Available upgrades are as follows:

- Up to four QuickAssist Technology (Intel QAT) accelerators
- Up to four Intel Dynamic Load Balancer (Intel DLB) accelerators
- Up to four Intel Data Streaming Accelerator (Intel DSA) accelerators
- Up to four Intel In-Memory Analytics Accelerator (Intel IAA) accelerators
- 512 GB SGX Enclave, an encrypted memory space for use by Intel Software Guard Extensions (SGX)

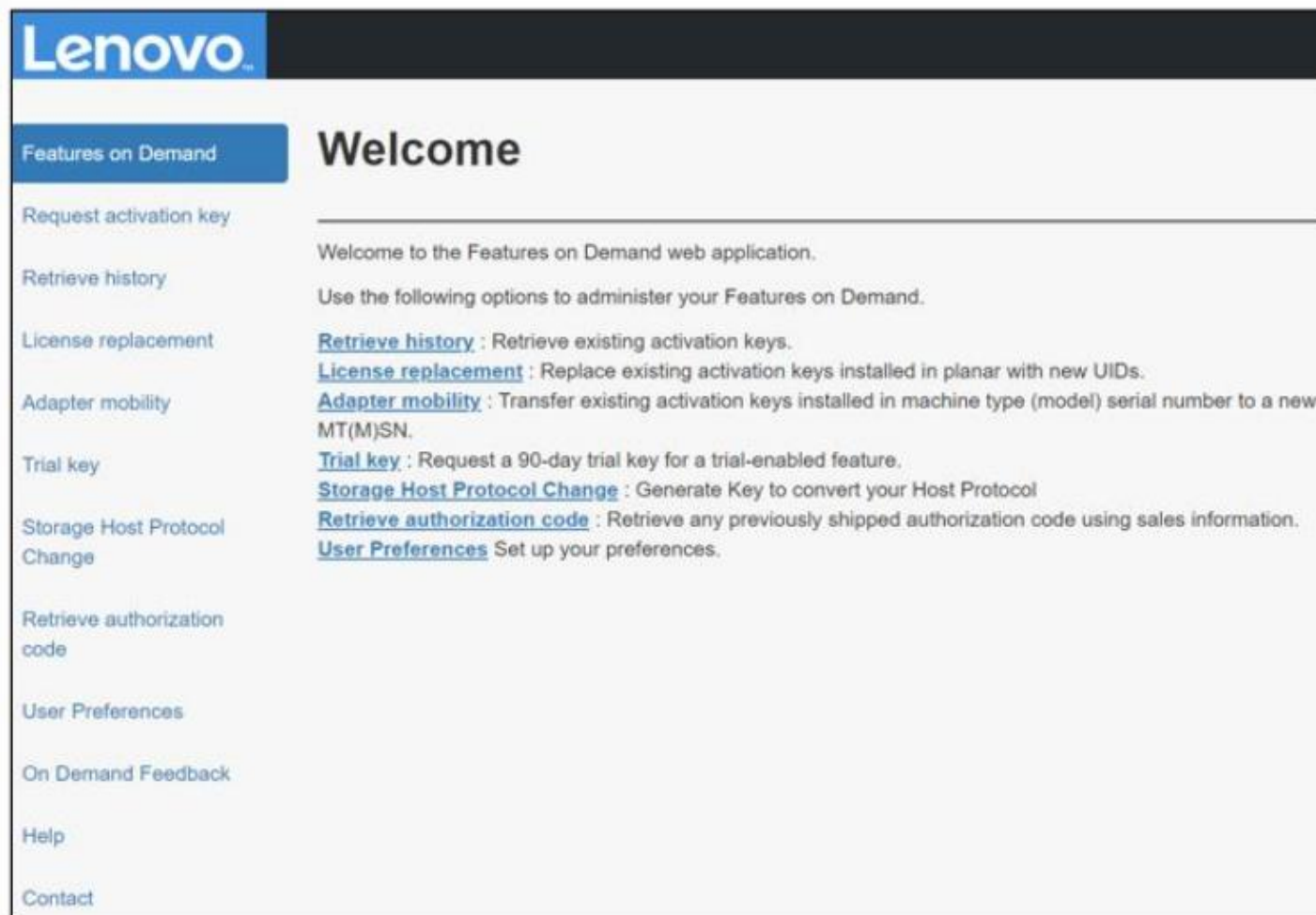
Note: Intel On Demand is not supported by all processors. For information about supported Intel CPUs and details of each feature, refer to [Lenovo Press](#).

Configuration rules

- Licenses can be activated in the factory using feature codes or as field upgrades using the option part numbers. Field upgrades allow customers to only activate the accelerators or increase the SGX Enclave size when their applications can best take advantage of them.
- Intel On Demand is licensed on individual processors.
- For servers with two processors, customers will need identical licenses for each processor.
- If customers add a second processor as a field upgrade, that processor must have an identical license with the first processor.
- Upgrades cannot be removed once activated.

Lenovo Features on Demand web page

The Lenovo Features on Demand web page is used to request, retrieve, and administer a user's features and licenses.



Lenovo

Features on Demand

Welcome

Welcome to the Features on Demand web application.

Use the following options to administer your Features on Demand.

- [Request activation key](#)
- [Retrieve history](#)
- [License replacement](#)
- [Adapter mobility](#)
- [Trial key](#)
- [Storage Host Protocol Change](#)
- [Retrieve authorization code](#)
- [User Preferences](#)
- [On Demand Feedback](#)
- [Help](#)
- [Contact](#)

[Retrieve history](#) : Retrieve existing activation keys.

[License replacement](#) : Replace existing activation keys installed in planar with new UIDs.

[Adapter mobility](#) : Transfer existing activation keys installed in machine type (model) serial number to a new MT(M)SN.

[Trial key](#) : Request a 90-day trial key for a trial-enabled feature.

[Storage Host Protocol Change](#) : Generate Key to convert your Host Protocol

[Retrieve authorization code](#) : Retrieve any previously shipped authorization code using sales information.

[User Preferences](#) Set up your preferences.

Installation tools

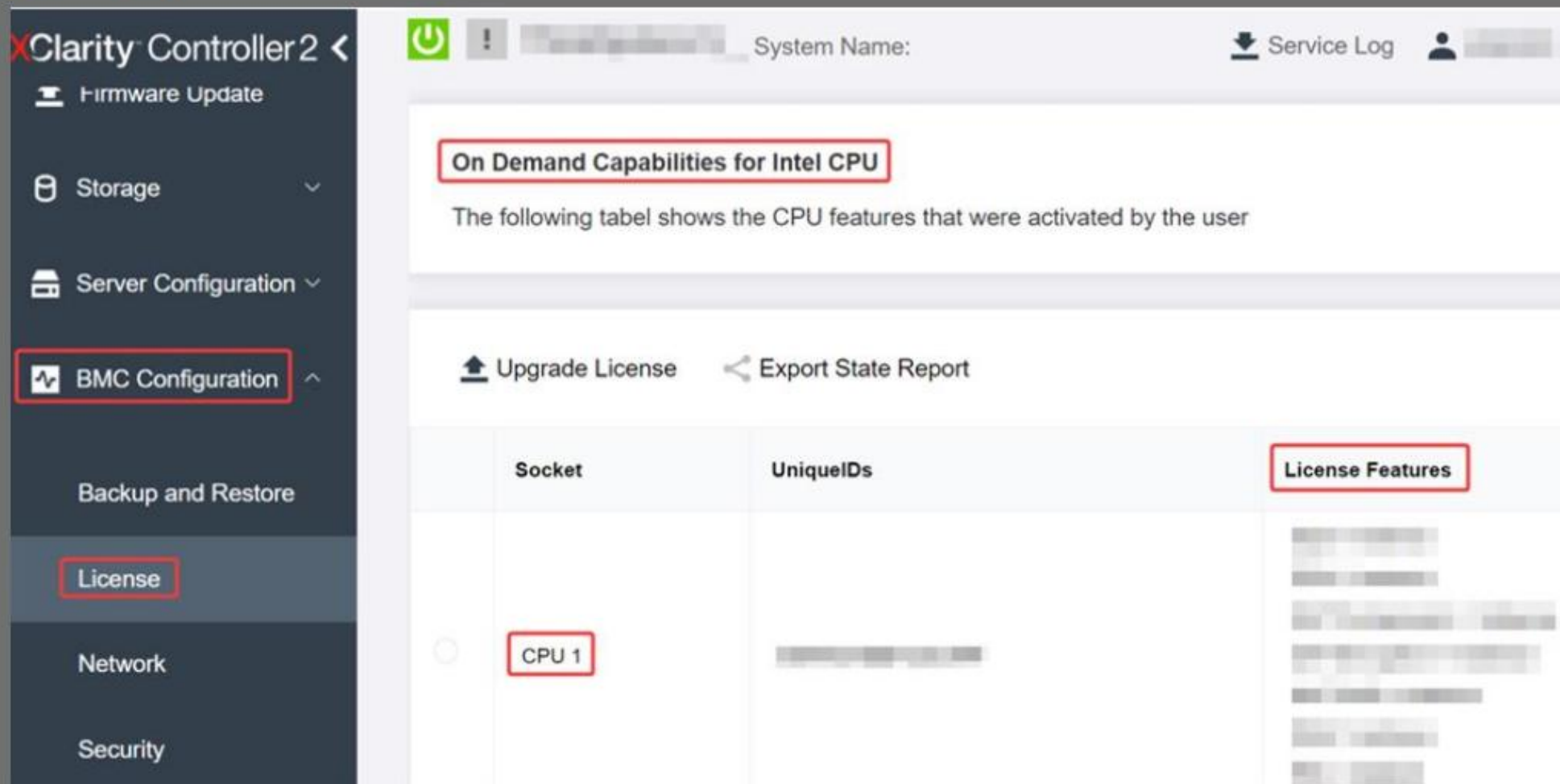
Intel On Demand can be installed through Lenovo XClarity Controller (XCC) or Lenovo XClarity Essentials OneCLI (OneCLI). XCC or OneCLI must be updated to the latest version before Intel On Demand features are applied.

Users can check the licenses installed on their system with the [XCC web GUI](#), [XCC REST API](#) and [OneCLI](#).

Note: LXCE OneCLI must be version 4.2.0 or above.

Installation tools

XCC web GUI



The screenshot displays the XCC web GUI interface. On the left is a dark sidebar with navigation options: 'Clarity Controller 2', 'Firmware Update', 'Storage', 'Server Configuration', 'BMC Configuration' (highlighted with a red box), 'Backup and Restore', 'License' (highlighted with a red box), 'Network', and 'Security'. The main content area has a top header with a power icon, a warning icon, a blurred system name, and a 'Service Log' link. Below this, a section titled 'On Demand Capabilities for Intel CPU' (highlighted with a red box) contains the text: 'The following tabel shows the CPU features that were activated by the user'. Underneath are links for 'Upgrade License' and 'Export State Report'. A table follows with columns 'Socket', 'UniqueIDs', and 'License Features' (highlighted with a red box). The table has one data row for 'CPU 1' (highlighted with a red box), showing a UniqueID and a list of license features.

Socket	UniqueIDs	License Features
CPU 1	[blurred]	[blurred list of features]

Installation tools

XCC REST API



- Use the GET method with the following Request URL:

GET `https://bmc_ip/redfish/v1/LicenseService/Licenses/`

- In the response JSON object, the `Members` field includes API information in the following format (`x` is the CPU number):

`/redfish/v1/LicenseService/Licenses/CPUx_OnDemandCapability`

In this example, you can see that the current XCC version supports Intel On Demand. If Intel On Demand is not supported, the XCC firmware needs to be updated to the latest version.

```
"Members": [  
  {  
    "@odata.id":  
    "/redfish/v1/LicenseService/Licenses/CPU1_OnDemandCapability"  
  },  
  {  
    "@odata.id":  
    "/redfish/v1/LicenseService/Licenses/CPU2_OnDemandCapability"  
  },  
]
```

Installation tools

OneCLI



Use the `OneCLI` command to check installed features:

```
OneCli.exe fod report -b XCC_USER:XCC_PASSWORD@XCC_HOST
```

- The output will show all licenses, including Intel On Demand features.

FoD Reports result:

=====					
Feature Type	Key ID	Status	Description/Feature List	User Reminding	Expired Date

N/A	CPU1_OnDemandCapability	StandbyOffline	DSA 4 instances, IAA 4 instances	N/A	N/A

N/A	CPU2_OnDemandCapability	Enabled	DSA 4 instances, IAA 4 instances	N/A	N/A

004a	XCC2_Platinum	Enabled	Lenovo <u>XClarity</u> Controller 2 Platinum Upgrade	N/A	N/A
=====					

Succeed.

Enabling Intel On Demand

Work through the following steps to use Intel On Demand features:

- Purchase an Intel On Demand license to receive an email with an authorization code.
- Check the Protected Processor Inventory Number (PPIN) of the processor to be installed with the Intel On Demand feature.
- Go to the Lenovo [Features on Demand web page](#) (LMKS) and enter the authorization code to acquire the Activation Key for the feature.
- Enter the Machine Type, Machine serial number, and PPIN.
- The website will generate the activation key, which can be downloaded or emailed to the user.
- Use XCC or OneCLI to apply the license to the processor with the activation key.
- Reboot the server.
- (Optional) Upload the Intel On Demand State Report.

Note: Individual steps will be explained in more detail on the following pages.

Note: The State Report shows the current configuration status of the Intel On Demand-capable processors in a server. After receiving a State Report from a customer, Lenovo can calibrate the current status of Intel On Demand-capable processors.

Transferring licenses

Before replacing a processor installed with Intel On Demand features, the license must be transferred to the new processor. Work through the following steps to transfer a license:

1. Use XCC or OneCLI to record the PPIN of the defective processor.
2. Replace the defective processor.
3. Turn on the server and read the new processor's PPIN.
4. Use the LKMS web page to obtain a new activation key.
5. Before applying the license to the new processor, make sure the XCC firmware has been updated to the latest version.
6. In the XCC web GUI, go to **BMC Configuration** → **License**. The On Demand capabilities will be shown in the **Intel CPU** section of the **License** tab.
7. Use **Upgrade License** → **Browse** → **Import** to upload the activation key.
8. Restart the server.
9. (Optional) Export and upload the State Report.

Note: Individual steps will be explained in more detail on the following pages.

Checking a PPIN

To enable Intel On Demand, users must have the processor's PPIN. The PPIN can be checked using the XCC web GUI, the XCC REST API, or OneCLI.

XCC web GUI

XCC REST API

OneCLI

Click the icons for more information.

Log in to the XCC web GUI and select the **Inventory** page → **CPU** tab → **Expand** → **PPIN**

The screenshot displays the XCC web GUI interface. On the left, a sidebar menu shows various system management options, with 'Inventory' highlighted. The main panel shows the 'CPU' tab with a table of installed processors. Two CPUs are listed: CPU 1 and CPU 2. For each CPU, a detailed view is expanded, showing various specifications. The 'PPIN' (Processor Part ID Number) is specifically highlighted for both CPUs with red boxes and red arrows originating from the 'Inventory' tab in the sidebar. The PPIN for CPU 1 is 'P00000000000000000000000000000000' and for CPU 2 is 'P00000000000000000000000000000000'.

Socket	Model	Max Cores	Part ID
CPU 1	Intel(R) Xeon(R) Platinum 8260	28	P00000000000000000000000000000000
CPU 2	Intel(R) Xeon(R) Platinum 8260	28	P00000000000000000000000000000000

Checking a PPIN

To enable Intel On Demand, users must have the processor's PPIN. The PPIN can be checked using the XCC web GUI, the XCC REST API, or OneCLI.

XCC web GUI

XCC REST API

OneCLI

Click the icons for more information.

To read the processor 1 PPIN, use the GET method with the following Request URL:

GET `https://bmc_ip/redfish/v1/Systems/1/Processors`

In the response JSON object, the ProcessorId field shows the ProtectedIdentificationNumber, which is the PPIN info of the requested CPU.

...

"ProcessorId": {

"ProtectedIdentificationNumber": "1234567890xxxyyy"

},

...

Checking a PPIN

To enable Intel On Demand, users must have the processor's PPIN. The PPIN can be checked using the XCC web GUI, the XCC REST API, or OneCLI.

XCC web GUI

Enter the following command:

```
OneCli.exe fod showppin -b XCC_USER:XCC_PASSWORD@XCC_HOST
```

The output will display the PPIN information.

XCC REST API

Machine Type: 7D75

Serail Number: 7D75012345

FoD PPIN result:

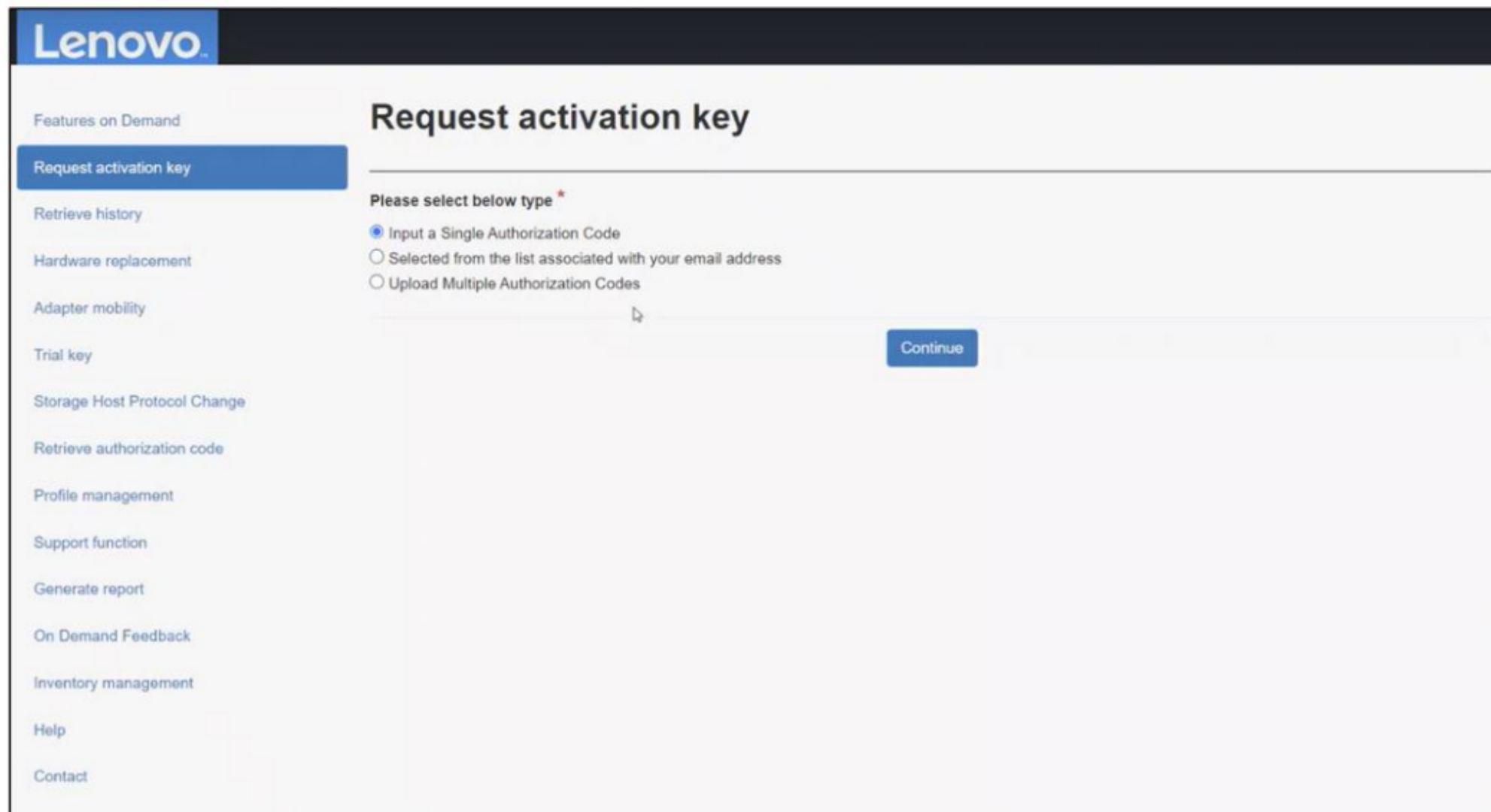
```
=====
|      Socket ID      |      PPIN      |
| Processor 1         | 49F2B81FGEF89BD3 |
| Processor 2         | 558DCC1FF51421F3 |
=====
```

OneCLI

Click the icons for more information.

Requesting an activation key -1

To request an activation key, users can input a single authorization code:



The screenshot shows a web interface for requesting an activation key. On the left is a vertical sidebar with the Lenovo logo at the top and a list of menu items: Features on Demand, Request activation key (highlighted in blue), Retrieve history, Hardware replacement, Adapter mobility, Trial key, Storage Host Protocol Change, Retrieve authorization code, Profile management, Support function, Generate report, On Demand Feedback, Inventory management, Help, and Contact. The main content area has a title 'Request activation key' and a sub-header 'Please select below type *'. Below this are three radio button options: 'Input a Single Authorization Code' (which is selected), 'Selected from the list associated with your email address', and 'Upload Multiple Authorization Codes'. A blue 'Continue' button is positioned to the right of the first option. The bottom of the page features a red Lenovo logo.

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Features on Demand

Request activation key

Retrieve history

Hardware replacement

Adapter mobility

Trial key

Storage Host Protocol Change

Retrieve authorization code

Profile management

Support function

Generate report

On Demand Feedback

Inventory management

Help

Contact

Request activation key

Please select below type *

- ☒ Input a Single Authorization Code
- ☐ Selected from the list associated with your email address
- ☐ Upload Multiple Authorization Codes

Continue

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Requesting an activation key -2

Log in to the website, select **Request activation key**, and then enter the necessary information in the **Machine Type**, **Machine serial number**, and **Intel PPIN** fields to get the activation key.

The screenshot shows the 'Request activation key' page on the Lenovo website. On the left is a sidebar with a 'Lenovo' logo at the top and a list of navigation links: 'Features on Demand', 'Request activation key' (highlighted in blue), 'Retrieve history', 'Hardware replacement', 'Adapter mobility', 'Trial key', 'Storage Host Protocol Change', 'Retrieve authorization code', 'Profile management', 'Support function', 'Generate report', 'On Demand Feedback', 'Inventory management', 'Help', and 'Contact'. The main content area is titled 'Request activation key' and contains a section 'Authorization Code details' with a descriptive paragraph. Below this are several input fields: 'Feature code' (text box with 'BX9E'), 'Feature description' (text box with 'Intel On Demand XCC MCC SGX 512GB Enclave'), 'Part number / PID' (text box with '1112233'), 'Remaining keys' (text box with '5'), 'Machine Type*' (dropdown menu with '7D72 - Lenovo ThinkSystem SR630 V3 Server'), 'Model' (dropdown menu), 'Machine serial number*' (text box with '12345678'), and 'Intel PPIN*' (text box with '1234567890999999'). At the bottom right are 'Continue' and 'Cancel' buttons.

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Features on Demand

Request activation key

Retrieve history

Hardware replacement

Adapter mobility

Trial key

Storage Host Protocol Change

Retrieve authorization code

Profile management

Support function

Generate report

On Demand Feedback

Inventory management

Help

Contact

Request activation key

Authorization Code details

If redeeming Feature on Demand activation code select your machine type and model if available and enter your 7 character machine serial number (Your machine serial number can be found on the front panel or in one of the system administration tools).

Feature code

Feature description

Part number / PID

Remaining keys

Machine Type*

Model

Machine serial number*

Intel PPIN*

Continue **Cancel**

Retrieving history -1

Users can also retrieve their license purchase history from the LKMS website. Information can be searched for by authorization code, unique identifier (UID), machine type serial number, or Lenovo Customer Number.

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Features on Demand

Request activation key

Retrieve history

Hardware replacement

Adapter mobility

Trial key

Storage Host Protocol Change

Retrieve authorization code

Profile management

Support function

Generate report

On Demand Feedback

Inventory management

Help

Contact

Retrieve history

Step 1: Search

Use authorization code or unique identifier(UID) or machine type serial number(MT\SN) to search for activation key history.

Please select a search type and enter a search value

Search type*

Search value*

Please select a search type ...

Please select a search type ...

Search history via authorization code

Search history via UID

Search history via machine type serial number

Search history via Lenovo Customer Number

Continue

Cancel

Retrieving history -2

Search results will be displayed, and they can also be downloaded or emailed to the user.

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Features on Demand

Request activation key

Retrieve history

Hardware replacement

Adapter mobility

Trial key

Storage Host Protocol Change

Retrieve authorization code

Profile management

Support function

Generate report

On Demand Feedback

Inventory management

Help

Contact

Retrieve history

Step 2: Result

This lists the activation keys generated for the uid entered.

Select the keys you want to retrieve and download the keys directly or have them send to your registered email address:

Note:To ensure that you continue to receive future correspondence without issues, please add lkms@lenovo.com as an expectation to your spam filter

☐ Select All

Generated keys for UID: 1234567890999999

	Feature	Details	Machine Type	Serial number
<input type="checkbox"/>	BX9E	Intel On Demand XCC MCC SGX 512GB Enclave	7D72	12345678
<input checked="" type="checkbox"/>	BX9A	Intel On Demand MCC Communications & Storage Suite 2	7D72	12345678

Email

Download

Back

Installing Intel On Demand on a processor

After retrieving the activation key from the website, users can apply the license through the XCC web GUI, the XCC REST API, or OneCLI.

XCC web GUI

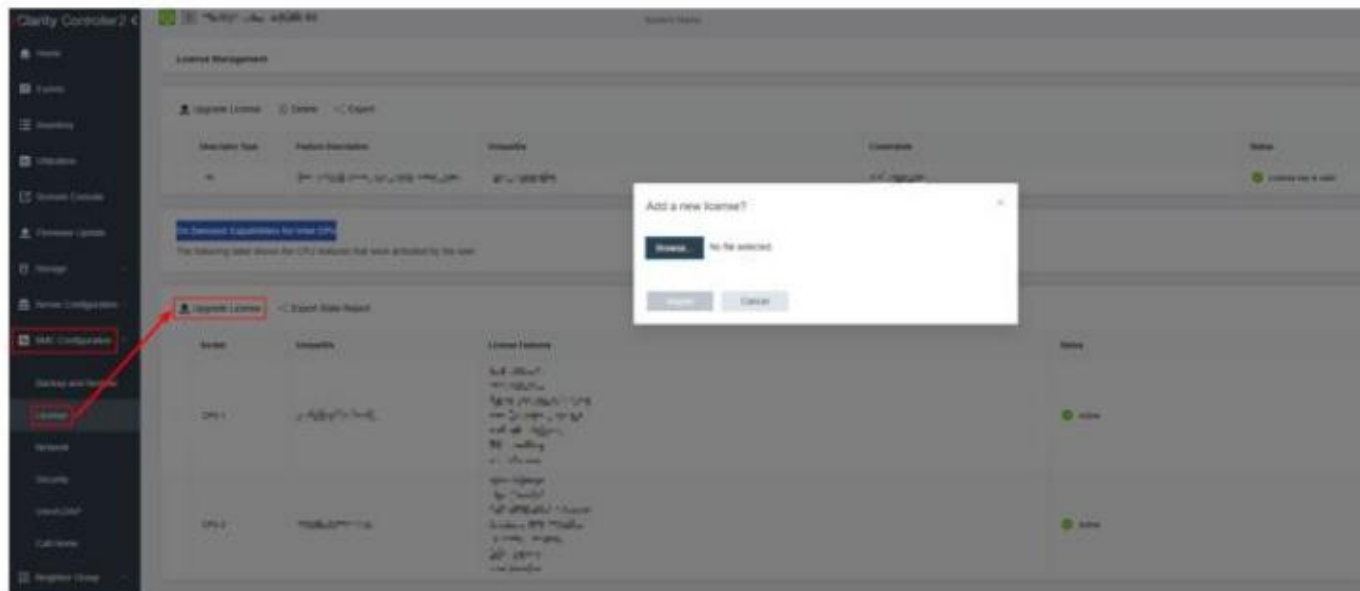
XCC REST API

OneCLI

Click the icons for more information.

Lenovo

Log in to the XCC web GUI and select **BMC Configuration → License → On Demand Capabilities for Intel CPU → Upgrade License → Browse → Import** to upload the activation key.



If the installation is successful, the following message will be displayed in a pop-up window:
License key upgraded successfully. The features will be activated on the processor after system power cycle.

Installing Intel On Demand on a processor

After retrieving the activation key from the website, users can apply the license through the XCC web GUI, the XCC REST API, or OneCLI.

XCC web GUI

Use the POST method with the following Request URL:

```
POST https://bmc_ip/redfish/v1/LicenseService/Licenses
```

Transfer the activation key to base64 string* and enter it into the LicenseString field as POST data.

```
{  
  "LicenseString": ""  
}
```

If the installation is successful, the following message will be displayed:

```
License key upgraded successfully. The features will be  
activated on the processor after system power cycle.
```

XCC REST API

OneCLI

Click the icons for more information.

Note: *To make the conversion, Linux users can run the `base64` command, and Windows users can use the [base64encode](https://base64encode.org/) website.

Installing Intel On Demand on a processor

After retrieving the activation key from the website, users can apply the license through the XCC web GUI, the XCC REST API, or OneCLI.

XCC web GUI

XCC REST API

OneCLI

Enter the following command with the activation key in place of <key_file>:

```
OneCli.exe fod install --keyfile <key_file>
```

If successful, the response will be:

```
Successfully install key
```

Call Lenovo Support if the following response is shown:

```
Failed to install key
```

Click the icons for more information.

Acquiring the Intel On Demand State Report

After completing the enablement or transfer of Intel On Demand features, acquire the State Report through the XCC web GUI, the XCC REST API, or OneCLI. Then, upload it to the Lenovo Features on Demand website.

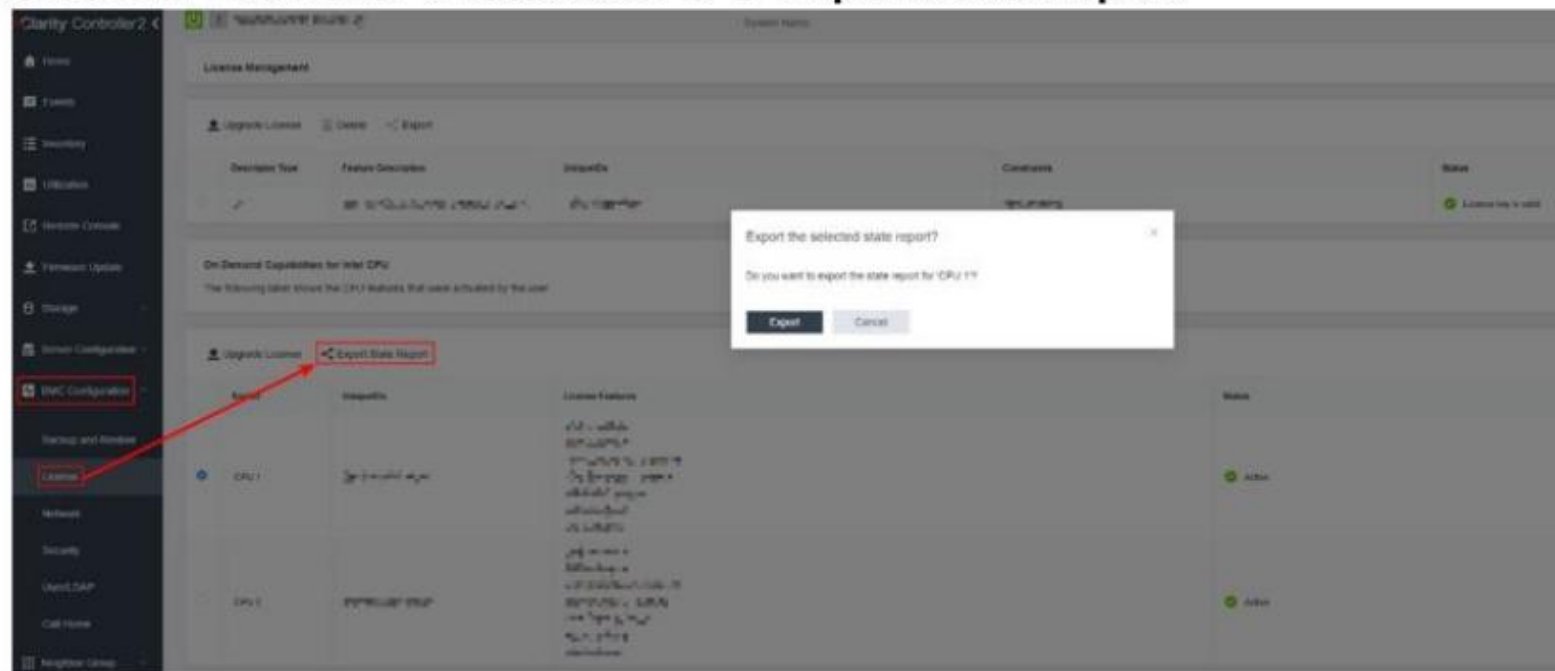
XCC web GUI

XCC REST API

OneCLI

Click the icons for more information.

Open the XCC web GUI, and go to **BMC Configuration → License → On Demand Capabilities for Intel CPU → select a CPU → Export State Report**.



Acquiring the Intel On Demand State Report

After completing the enablement or transfer of Intel On Demand features, acquire the State Report through the XCC web GUI, the XCC REST API, or OneCLI. Then, upload it to the Lenovo Features on Demand website.

XCC web GUI

Step1: Use the GET method with the following Request URL to retrieve the CPU State Report API (**x** is the processor number):

```
GET  
https://bmc_ip/redfish/v1/LicenseService/Licenses/CPUx_OnDemandCapability
```

XCC REST API

OneCLI

Click the icons for more information.

Step

1

2

3

4

Click each number in turn to see the procedure.

Acquiring the Intel On Demand State Report

After completing the enablement or transfer of Intel On Demand features, acquire the State Report through the XCC web GUI, the XCC REST API, or OneCLI. Then, upload it to the Lenovo Features on Demand website.

XCC web GUI

XCC REST API

OneCLI

Step 2: In the JSON response, the `target` field under `LenovoLicense.ExportStateReport` shows the CPU State Report API – (**x** is the processor number):

```
"Actions": {
  "Oem": {
    "#LenovoLicense.ExportStateReport": {
      "title": "ExportStateReport",
      "target": "/redfish/v1/LicenseService/Licenses/CPU
x_OnDemandCapability/Actions/Oem/LenovoLicense.ExportStateReport"
    }
  }
},
```

Click the icons for more information.

Acquiring the Intel On Demand State Report

After completing the enablement or transfer of Intel On Demand features, acquire the State Report through the XCC web GUI, the XCC REST API, or OneCLI. Then, upload it to the Lenovo Features on Demand website.

XCC web GUI

XCC REST API

OneCLI

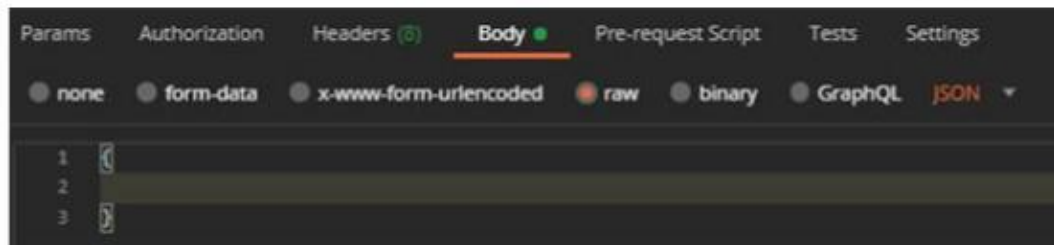
Step 3: You can retrieve the State Report with the following methods:

- A. Use the POST method with the following Request URL to retrieve the CPU State Report API – (**x** is the processor number):

POST

`https://bmc_ip/redfish/v1/LicenseService/Licenses/CPUX_OnDemandCapability/Actions/Oem/LenovoLicense.ExportStateReport`

- B. Use an empty JSON object as POST data. When using an API tool such as Postman, enter an empty JSON object in **Body** → **Raw** → **JSON**, and enter `{}` (a NULL object) in the JSON file.



Click the icons for more information.

Step

1

2

3

4

Click each number in turn to see the procedure.

Acquiring the Intel On Demand State Report

After completing the enablement or transfer of Intel On Demand features, acquire the State Report through the XCC web GUI, the XCC REST API, or OneCLI. Then, upload it to the Lenovo Features on Demand website.

XCC web GUI

XCC REST API

OneCLI

Click the icons for more information.

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Step 4: Retrieve the State Report from the stateReports field.

```
{
  "stateReports": [
    {
      "syntaxVersion": "1.0",
      "timestamp": "",
      "objectId": "",
      "hardwareComponentData": [
        {
          "hardwareId": {
            "type": "PPIN",
            "value": ""
          },
          "stateCertificate": {
            "pendingCapabilityActivationPayloadCount":
              "value": ""
          },
          "hardwareType": "CPU"
        }
      ]
    }
  ]
}
```

Step

1

2

3

4

Click each number in turn to see the procedure.

Acquiring the Intel On Demand State Report

After completing the enablement or transfer of Intel On Demand features, acquire the State Report through the XCC web GUI, the XCC REST API, or OneCLI. Then, upload it to the Lenovo Features on Demand website.

XCC web GUI

XCC REST API

OneCLI

Click the icons for more information.

Lenovo

```
    "syncVersion": "1.0",  
    "timestamp": "",  
    "objectId": "",  
    "hardwareComponentData": [  
      {  
        "hardwareId": {  
          "type": "PPIN",  
          "value": ""  
        },  
        "stateCertificate": {  
          "pendingCapabilityActivationPayloadCount":  
            "value": ""  
        },  
        "hardwareType": "CPU"  
      }  
    ]  
  }  
}
```

Step

1

2

3

4

Click each number in turn to see the procedure.

Acquiring the Intel On Demand State Report

After completing the enablement or transfer of Intel On Demand features, acquire the State Report through the XCC web GUI, the XCC REST API, or OneCLI. Then, upload it to the Lenovo Features on Demand website.

XCC web GUI

Enter the following command to retrieve the State Report :

```
OneCli.exe fod exportreport -b  
XCC_USER:XCC_PASSWORD@XCC_HOST
```

XCC REST API

Upload State Report with the following command:

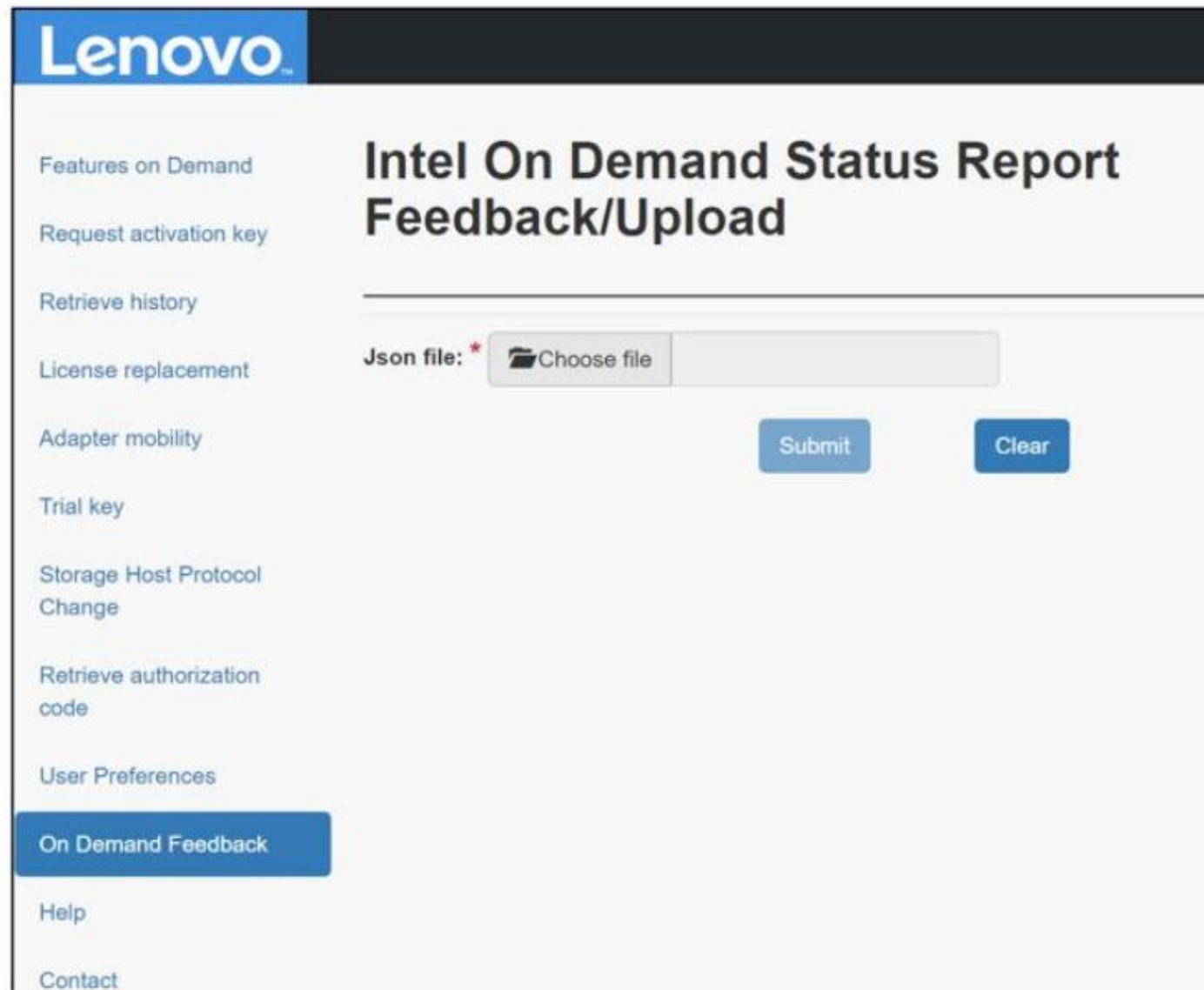
```
OneCli.exe fod uploadreport --file  
CPU1_XXXXXX_StateReport.json --kmsid KMS_USER:KMS_PASSWORD
```

OneCLI

Click the icons for more information.

Uploading the Intel On Demand State Report

Log in to the Lenovo Features on Demand website, select **On Demand Feedback**, and then upload the State Report by selecting the desired JSON file.



The screenshot shows the Lenovo On Demand Feedback/Upload interface. On the left is a vertical navigation menu with the following items: Features on Demand, Request activation key, Retrieve history, License replacement, Adapter mobility, Trial key, Storage Host Protocol Change, Retrieve authorization code, User Preferences, On Demand Feedback (highlighted with a blue background), Help, and Contact. The main content area has a dark blue header with the 'Lenovo' logo. Below the header, the title 'Intel On Demand Status Report Feedback/Upload' is displayed. Underneath the title is a form for uploading a JSON file. It includes a label 'Json file: *', a 'Choose file' button with a file icon, and a text input field. To the right of the input field are two buttons: 'Submit' and 'Clear'.

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Intel On Demand Status Report Feedback/Upload

Json file: *

Features on Demand

Request activation key

Retrieve history

License replacement

Adapter mobility

Trial key

Storage Host Protocol Change

Retrieve authorization code

User Preferences

On Demand Feedback

Help

Contact

Enabling Intel On Demand – troubleshooting

The following table shows messages that might be displayed after users import a license to enable Intel On Demand features. The corresponding user actions are also provided.

Message	User Action
License key upgraded successfully. The features will be activated on the processor after system power cycle.	Reboot the system to activate the Intel On Demand features.
The activation key format is invalid	Check the activation key file. If the error persists, contact Lenovo Support.
Invalid processor PPIN in Activation key	Check if the PPIN in the activation key file and processor are identical.
The license was installed in the processor already	The activation key has been used on the other processor. Check the activation key.
Not enough NMRAM space in the processor	Contact Lenovo Support.
Internal error	Contact Lenovo Support.

Note: For more error messages and user actions, refer to [Lenovo Docs](#).

Enabling Intel On Demand – troubleshooting

The following table shows messages that might be displayed after users import a license to enable Intel On Demand features. The corresponding user actions are also provided.

Message	User Action
The license was installed in the processor already	The activation key has been used on the other processor. Check the activation key.
Not enough NMRAM space in the processor	Contact Lenovo Support.
Internal error	Contact Lenovo Support.
Cold reset needed before next provisioning	Restart the system, and then import the activation key.
Unable to provision LAC due to FEH error	Contact Lenovo Support.
Unable to import license in shutdown state, please try again after power on.	Power on the system before installing Intel On Demand.
Unable to import license due to On Demand Capabilities information is in progress. Please try again later.	If you want to continue installing an activation key, try again later.

Note: For more error messages and user actions, refer to [Lenovo Docs](#).