

SUSE Linux Enterprise Server - Support for Intel Server Platforms

YES Certified Products

SUSE Linux Enterprise Server 12

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Customers often need to know in detail which versions of SUSE Linux Enterprise Server are supported by a specific Intel* microarchitecture. This article explains the background why there is no easy answer to that question, and what details are really important for customers to know about supported systems and where to find the correct information.

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1 Background

The purpose of this article is to answer one of the most often asked and seemingly simple question. But even if the question seems to be simple, there is no simple answer to it. For the sake of illustration actual customer questions about a specific Intel code named “Haswell” (the Intel E7-4800 v3 CPU), as well as a comparison to some IHV implementations (HP* x240 and IBM* 3520 servers) are used in the document at hand. The concepts presented here however apply to just about every standard Intel server platform, and in principle they apply to desktop and mobile platforms as well.

2 The Question About Platform Support

Among the most frequently asked customer questions regarding SUSE Linux Enterprise Server are question about general platform support. For the purpose of the document at hand, we formulate them as follows:

- Question 1: Which SUSE Linux Enterprise Server releases support Haswell CPUs and chipsets?
- Question 2: We see that that HP x240 and IBM x3520 servers utilizing Haswell chipsets have been YES certified. Does this mean that the Intel E7-4800 v3 CPU is also supported?

The short answer to these question is: SUSE supports what is YES Certified. Anything else should be considered unknown. But looking under the surface, the answer is much more complex:

Haswell is **not** a chipset or a CPU. It is a microarchitecture design behind a range of CPUs used in lightweight, low power mobile platforms up to highly scalable server systems. The first CPUs and platforms under this microarchitecture were released in 2013. Until 2015, a huge number of CPUs had been added. They can be (and unfortunately are) all referred to as “Haswell” platforms even if they differ in their design and operating system support.

Since Haswell (and every other Xeon* CPU released by Intel) is backward compatible from an instruction set standpoint, theoretically it and other new Intel CPUs can run every previous version of SUSE Linux Enterprise Server. This means that, at from a technical or CPU perspective, Haswell can run on SUSE Linux Enterprise Server 12 and any older version of it. But, customers do not use CPUs alone; they use complete systems. These systems are comprised of other components besides the CPU. Of all these components, the CPU itself normally has the least impact

on the operating system support. In consequence, a statement about Haswell support, or even a specific Intel CPU version does not provide valuable information to the customer wanting to know which server **systems** are supported with which operating system version.

SUSE only provides support for complete systems that have been validated by SUSE or the hardware vendors for use with the particular version of SUSE Linux Enterprise server. [^2]

When a system has been validated as supported for a given major release of SUSE Linux Enterprise Server and its Service Packs, it is considered supported for the subsequent service packs of that major release. With new major releases currently the hardware must be re-validated for supportability. However SUSE strives to make sure recent hardware that is supported on previous releases will also be supported on new major releases. It is possible that very old hardware will be “dropped” from support with very new major versions of SUSE Linux Enterprise Server.

In addition, SUSE avoids to make generalized support statements for CPU or CPU micro-architectures (for example “Haswell”) to end users. SUSE includes some statements about CPU support in the SUSE Linux Enterprise Server release notes. However, these statements are based on new CPUs that were used during development and testing of the new SUSE release and are not meant to indicate supportability of any particular hardware system.

The following sections will provide more details about the reasons why SUSE only supports validated systems.

3 Full System Validation Counts

Systems are made up of CPUs, basic I/O “chipsets”, Network and storage controllers and Firmware. To determine if a system is supported requires that the complete system is tested for compatibility. The components that typically affect supportability in SUSE Linux Enterprise Server releases are briefly described in the following sections.

3.1 CPUs

Intel CPUs are basically compatible with all versions of SUSE Linux Enterprise Server. They will execute x86 or x86_64 based code in a compatible way and therefore run our software. This is a theoretical statement. In practice the other components that make up the complete system utilizing a CPU are usually the determining factors that dictate which version of the operating system is required for support and that make the use of older operating system versions with newer CPUs challenging.

3.2 Basic I/O Chipset

Most people refer to the basic I/O chipset or Platform Controller Hub (PCH) for Intel based systems as the “chipset”, or in our case for the document at hand the “Haswell chipset”. These chipsets may require updates to the kernel or other operating system subsystems for proper support. In the HP and IBM examples given, these are two different chipsets: HP x240 utilizing Intel C610, IBM x3250 utilizing Intel C226. Because the two systems make use of two different chipsets, knowing that the HP system is supported does not allow for any statement about the support status of the IBM system.

In addition, the E7-4800 v3 CPUs from the example above and referenced in the query most likely use yet a different chipset. Again, knowing the status of the HP and IBM systems does not help to determine if the systems the customer is interested in (and which are not specified) are also supported.

3.3 Network and Storage Adapters

Looking at the network and storage adapters, here is where real divergence begins. Regardless of the CPU microarchitecture used, each system vendor is free to pick and choose different network and storage adapters for their systems. Even individual systems within a microarchitecture family will have different controller options. Support for these controllers is dependent on service pack levels and/or driver updates.

3.4 System Firmware

Last but not least, the system firmware plays an important role in the compatibility of SUSE Linux Enterprise Server with hardware. It can make a difference between a system booting or not.

Firmware implementation is often required for certain CPU or platform features to function. Vendors can choose to disable or otherwise “control” platform features via system firmware. Therefore it is not possible to make a statement about supportability of any platform or its features without testing and validating that platform with its particular firmware implementation.

3.5 Summary

To claim supportability of a product (for example a particular vendors server model) that the customer will use requires testing and validating all parts of the product - not just the CPU. Support statements around particular CPUs or CPU microarchitectures do not help to determine if any specific server product is supported.

Therefore SUSE only makes support statements around individual, validated systems. We do that via YES certifications.

4 New CPU Features

There is another dimension that does not allow for statements about the supportability of microarchitectures such as “Haswell” in general or specific CPUs like E7-4800 v3. New CPUs, while backward compatible, also bring new features. These new features usually do not affect operating system operation or support, but might provide added value that the customer is interested in leveraging.

Such new features might require updates to the operating system to function properly. The list of CPU features is long and SUSE currently does not maintain a comprehensive matrix of all features supported. Again, even those features may depend on system vendor implementation (firmware can disable such features). If customers are interested in the support for a specific CPU feature, they should ask SUSE or the hardware vendor about the specific requirement for the definitive answer. In some cases SUSE will need to work together with Intel and the system manufacturer to validate the support of any specific CPU feature.

5 YES Certification



Information technology is a critical asset for any business and deploying compatible and supported hardware protects and enhances your valuable information technology assets. For hardware, SUSE works closely with companies testing products through the YES Certified program.

The two main goals of the YES Certified Program are:

- Help customers easily identify and purchase hardware solutions that have been tested for compatibility and are supported in a SUSE environment.
- Help Hardware Vendors deliver and market solutions that work well and are easily supported in a SUSE environment.

YES Certified is for hardware applications. Because these products interact directly with an operating system, SUSE has developed rigorous compatibility tests to ensure very high levels of compatibility between hardware and the operating system. Hardware Vendors participating in the YES Certified program agree to a close relationship with SUSE for delivering support to customers. In addition, YES Certified configurations are documented and published as official YES Certified bulletins on the SUSE web site.


If you call SUSE for end-user or system integrator support and your network incorporates YES Certified products, SUSE technicians can reference existing support documentation such as YES Certified bulletins and Technical Information Documents. If the error persists, technicians can duplicate the situation in a SUSE lab or work with the product vendor, leveraging the relationship that was developed during the testing process, to resolve the problem. In short, YES Certified is the first line of hardware interoperability assurance for SUSE customers.

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