

Researching In Service Software Upgrade Compatibility

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The addition of In Service Software Upgrade capability for Cisco IOS adds a new element of research for determining which Cisco IOS release is appropriate and what upgrade procedure to use. This paper offers some insight for using the tools available on CCO to get information regarding ISSU compatibility.

Cisco IOS® Software is the world's leading network infrastructure software, delivering a seamless integration of technology innovation, business-critical services, and hardware support. Currently operating on over ten million active systems, ranging from the small home office router to the core systems of the world's largest service provider networks, Cisco IOS Software is the most widely leveraged network infrastructure software in the world.

The Evolution Continues

Software is called 'soft' because it is subject to continuous evolution and change. Cisco customers are masters at finding new and innovative uses for their networks and infrastructure to increase productivity, agility, and achieve competitive advantage. Requests for additional function and features are often received from customers so that they may increase the value they derive from their Cisco-powered network. Cisco Engineers are also hard at work, developing innovative enhancements to solve new problems or increase performance. In many instances, a software upgrade is all it takes to gain new capabilities or reap more benefits from the network infrastructure.

The Availability Equation

When the need to perform a software upgrade arises, planning is important. The new software should be analyzed to be sure it meets the defined requirements. Careful analysis of the applicability of the software with deployed hardware is necessary. And the new software should be verified by testing in a lab environment as appropriate.

It is also necessary to plan for the software upgrade from an operational standpoint. Many Enterprises and Service Providers have change control procedures and perform risk assessment for all software changes. Part of the impact assessment is to analyze the expected downtime due to the software change. Going forward, Cisco IOS can be installed "In-Service" for certain products. Performing an In Service Software Upgrade (ISSU) as opposed to a device reload significantly reduces the impact and downtime for the change. Over time, more products will gain this capability. This means that another step has been added to the planning process to determine the method of upgrade - answering the question, 'can I upgrade using ISSU?' - and confirming the ISSU compatibility of a target release against an installed or running release.

This short paper illustrates the steps and tools to help you determine ISSU compatibility.

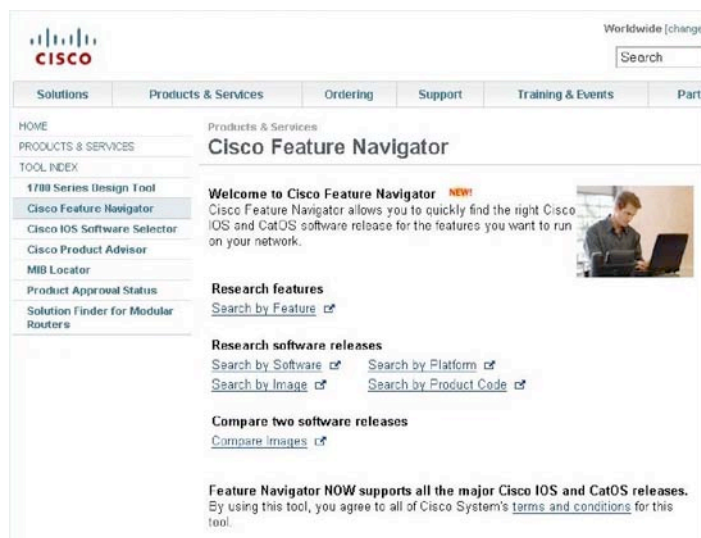
Tools To Determine Issu Compatibility

Cisco.com is your destination for Cisco IOS Software planning. Here you'll find a wealth of information about Cisco products and services. Be sure to Login so you'll have access to the Download pages.

Cisco Feature Navigator (CFN) will help you determine which software is appropriate to meet your requirements and provide information regarding ISSU compatibility. You can easily find the CFN by keying <http://www.cisco.com/go/fn>.

From CFN, you are presented with a screen similar to the one depicted in Figure 1. From there, you have easy access to CFN "Search by feature".

Figure 1. Cisco Feature Navigator



Suppose you have a Cisco C10000 Series router and you are interested in a new feature available in a new release of Cisco IOS Software. You may have identified the feature you want and used CFN to find the particular release that supports the feature.

You already know the Cisco IOS Software version currently running in your C10000 Series router. What you want to determine is whether you will be able to upgrade your current running version to the new version using the ISSU process. Comparing the two software releases is the easiest way to determine ISSU capability.

An example of what you will see is shown in Figure 2.

Figure 2. Image Comparison

ISSU compatibility information is at the bottom of the comparison page. Images may be either “Compatible”, “Base Compatible” or “Incompatible”. This refers to the level of compatibility between the image in question and the previous Cisco IOS Software images listed in the table.

The three designated compatibility levels are:

- **Compatible:** When the *base-level system infrastructure AND all optional HA-aware subsystems are compatible*, the IOS image versions are considered “compatible”. This means an in-service upgrade or downgrade between these versions will succeed with minimal service impact.
- **Base-Level Compatible:** If *one or more of the optional HA-aware subsystems are not compatible*, the Cisco IOS image versions are considered “base-level” compatible. This means an in-service upgrade or downgrade between these versions will succeed, however, some subsystems will not be able to maintain state during the transition. Careful consideration of the impact this may have on operation and service is required before an in-service upgrade should be attempted.
- **Incompatible:** There exists core set of system infrastructure that must be able to interoperate in a stateful manner for SSO to function correctly. If any of these “required” features or protocols is not interoperable between two releases, then the two versions of the Cisco IOS images are declared “Incompatible”. This means an in-service upgrade or downgrade between these versions is not possible. Alternatively, a *fast software upgrade* (FSU) can be performed. FSU is service impacting.

You can also see compatibility information as you are comparing the available features in two different images. Figure 3, for example, depicts a sample display from CFN with the ISSU compatibility information.

Figure 3. CFN ISSU compatibility display

In this way you can easily determine which features are ISSU compatible with your current Cisco IOS Software version or, more importantly, which features are not compatible if the target version is designated as only “Base-level compatible”. This will give you an indication as to whether particular features or function—and therefore, users—might be impacted when you perform an upgrade. If you are not making use of those particular features or determine the impact to be minor, then you might decide to go ahead even when the compatibility is designated “Base-level”.

Summary

Cisco IOS In Service Software Upgrade significantly reduces the impact planned software upgrades and maintenance can have on service availability. ISSU changes the operational procedure for performing Cisco IOS software upgrades. The risk assessment criteria are also changed, since impact to users is much less than before.

To gain the benefit, proper planning is necessary. Cisco.com has the tools you need to allow you to reap the benefits of ISSU and to easily determine compatibility between Cisco IOS Releases.

For detailed information about Cisco IOS ISSU, please refer to the Cisco IOS ISSU Deployment Guide also available on Cisco.com.



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