

IBM Z

Coupling Considerations for the z15



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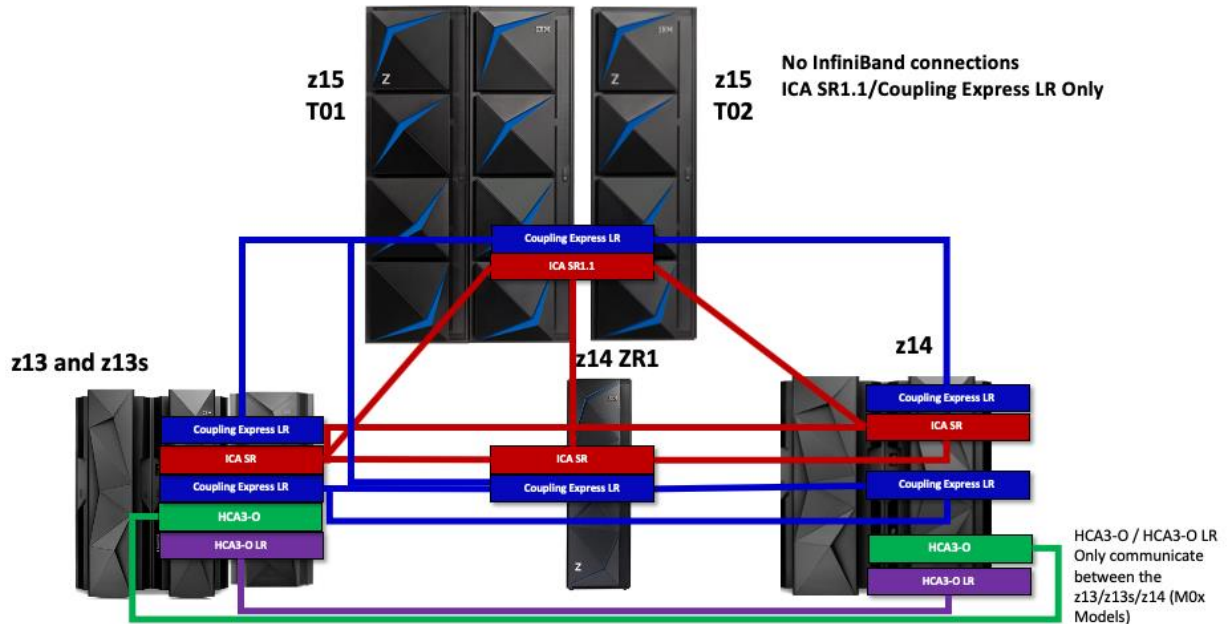
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IBM z15 Coupling Diagram

Figure 1



An IBM z15 system will be able to participate in a Sysplex with both the z13 and z14 families of systems connecting via either Coupling Express LR and/or ICA SR1.1. The ICA SR1.1 is fully compatible with the ICA SR offered on the z13 and z14 systems. With the announcement of the z14, IBM issued a Statement of Direction that the z14 (model 3906) would be the last system to support HCA3-O and HCA3-O LR adapters (InfiniBand coupling links). This was fulfilled with the introduction of the z14 ZR1, which only offered ICA SR and Coupling ExpressLR adapters for coupling. The IBM z15 is the first generation which will not offer the InfiniBand coupling links. Depending on the environment, this can cause migration concerns when upgrading to a z15 T01 or a z15 T02.

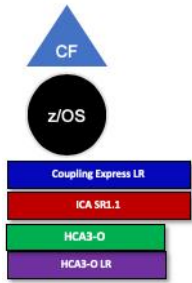
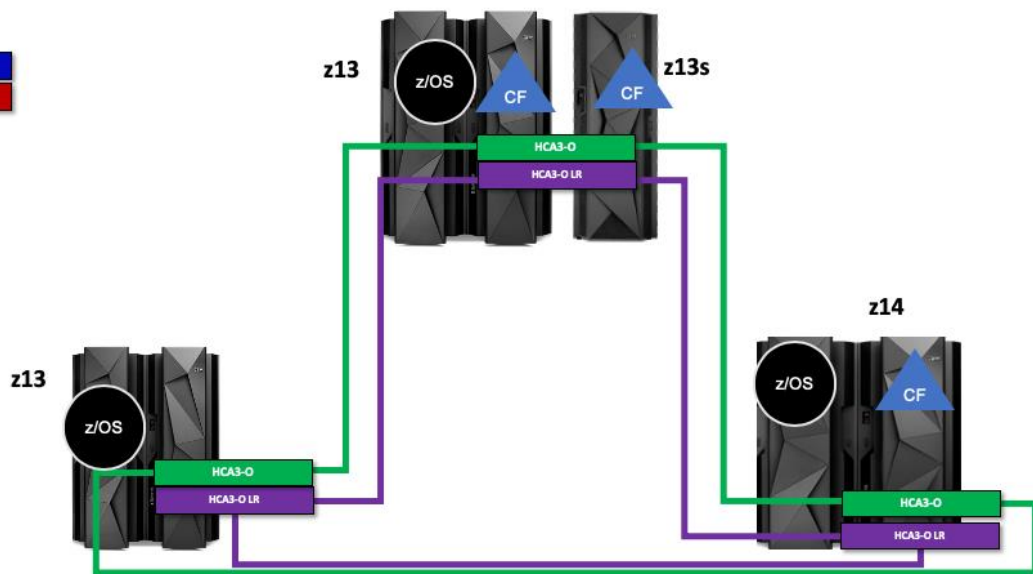


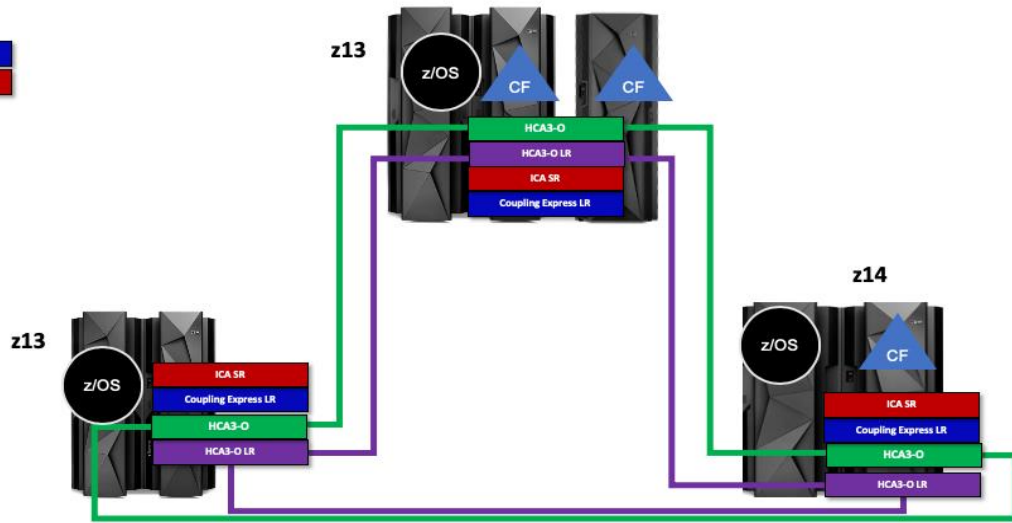
Figure 2



Looking at an example of an environment today, we have several systems connected in a parallel sysplex. For this example, we will be using two z13 systems: a z13s as a standalone coupling facility, and a z14 system. As like most environments, the features used in an upgrade are based off the past systems. Therefore, most clients would have used HCA3-O adapters to migrate from prior systems. Because the ICA SR adapter was first introduced on the z13 and the Coupling Express LR adapter was introduced with the z14, some environments still use HCA3-O adapters like in figure 2. Since all of the systems are connected, all of the z/OS images can participate in the sysplex housed on both the z13, z13s and z14 systems. The coupling facility requires any active z/OS images in the sysplex to be directly connected to it via internal or external links. This is a working, stable environment because all of the z/OS images can connect to both coupling facilities.



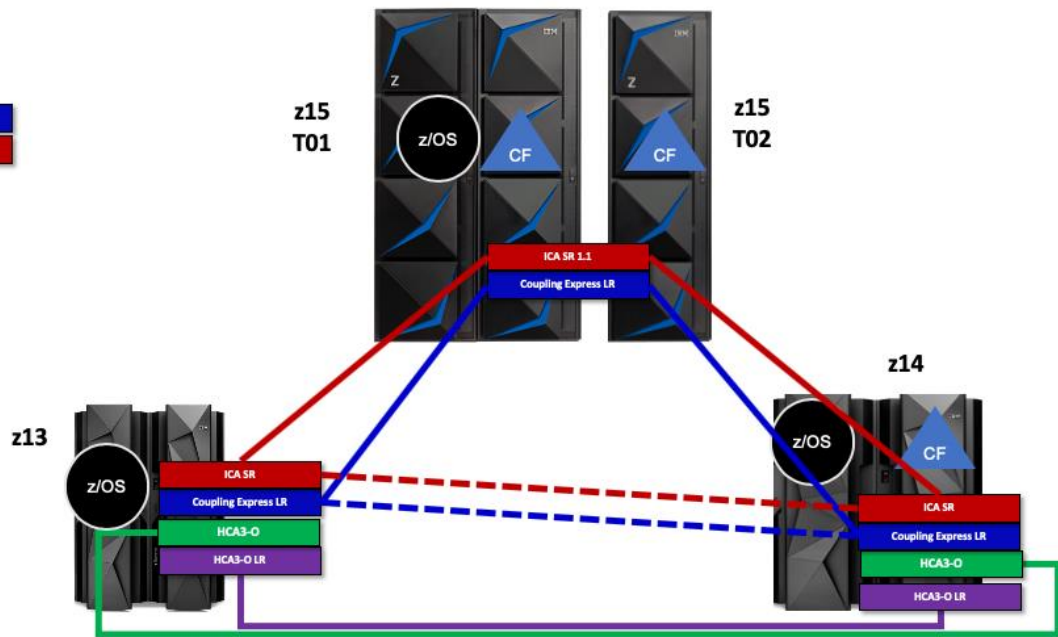
Figure 3



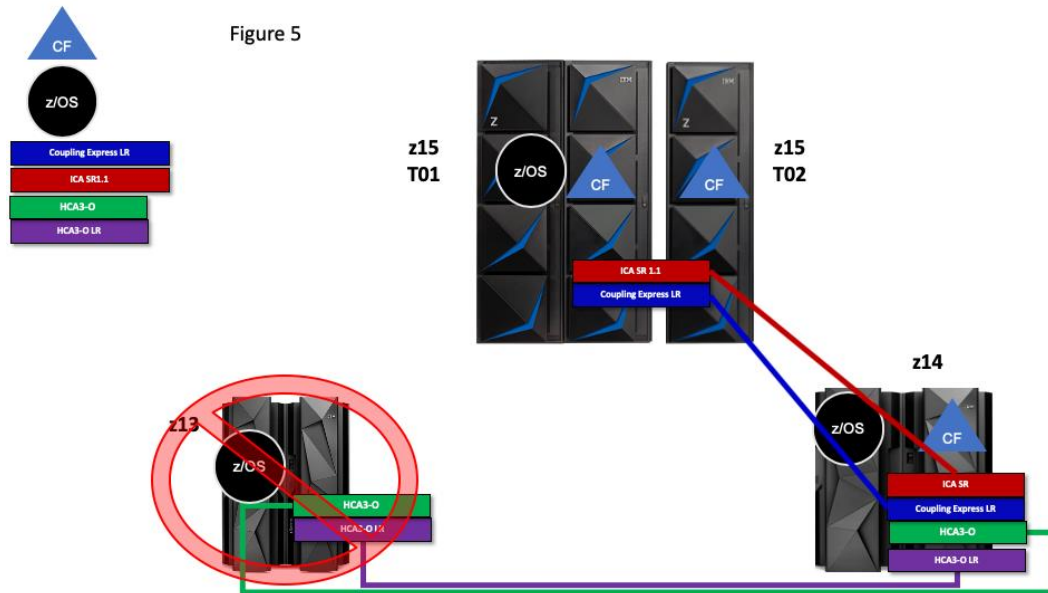
Before upgrading any system in this environment to a z14 ZR1 or a z15T01/T02, clients will need to purchase and install newer coupling adapters. This will ensure they are prepared for future growth and expansion. As in figure 3, these adapters do not need to be utilized right away, but will be used during a migration to a newer system. Once a z15 is introduced, clients can utilize the newer adapters (Figure 4). Older links can still be used between the z13 and z14 in this example, but IBM recommends migrating that communication to newer adapters as well.



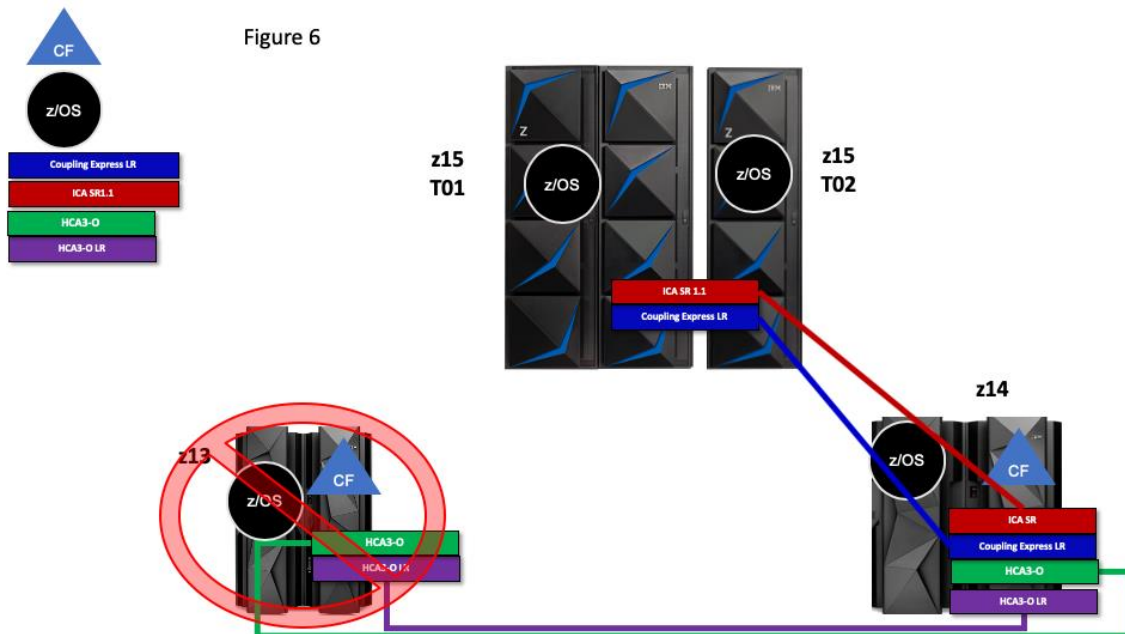
Figure 4



The environment in figure 4 is an example of a simple migration that maintains the redundancy of a sysplex environment as all systems remain interconnected. There is a migration concern if a client is upgrading an environment with z13 or z13s system that does not currently have ICA SR or Coupling Express LR adapters. The IBM z13 and z13s systems went out of marketing at the end of June 2019 and therefore can no longer be upgraded to have new adapters. As of April 2020, the z14 hasn't been withdrawn from marketing and newer coupling adapters can still be purchased as needed.



In the situation depicted in figure 5, you will not be able to add a z15 T01 or a z15 T02 to the environment without reconfiguring the sysplex. There is no direct connection between the z13 and z15 systems. Because of this, the z/OS images that run on the z13 cannot participate in the sysplex housed in the coupling facility on the z15 or vice versa, like in figure 6.



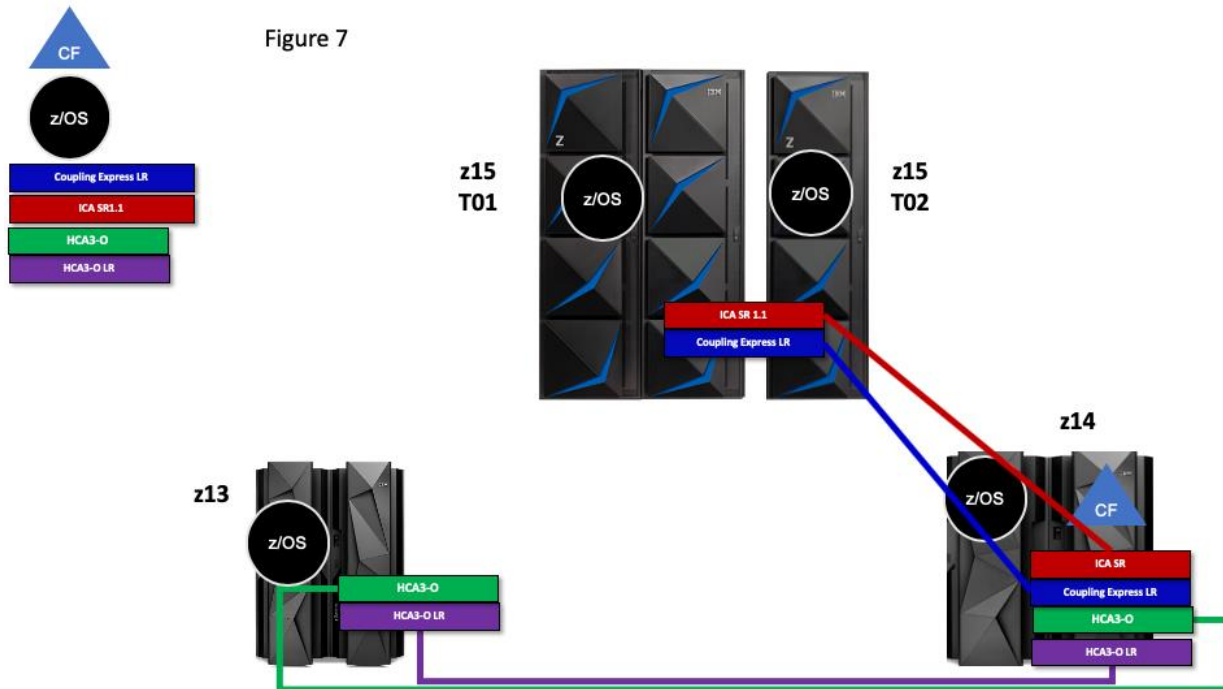


Figure 7

The only way to have a z15 T01 or z15 T02 operate in a sysplex environment with a z13 that only has access to InfiniBand coupling links is to implement a bridge configuration. In a bridge configuration, the system that houses the coupling facility has the ability to connect to both systems using the InfiniBand cards, ICA SR features, and Coupling Express LR cards. The only valid bridge system in this situation is the z14 dual frame because you can configure both the older and newer coupling technology.

In Figure 7 above, the coupling facility is housed on the z14 because all of the z/OS images on the other systems can couple directly to it. In this environment, everything can work homogeneously in the sysplex as before. Using this design allows you to continue running the sysplex while other z13 systems are upgraded to new machine types. Clients should continue to use this method until the environment can function using ICA SR cards and Coupling ExpressLR cards.

Clients should only use this bridge paradigm for migration purposes. Running in this state has implications on the sysplex and also in server time protocol (STP). In this configuration, you will not be fully redundant. If there is a problem with the bridge system, you could lose connectivity to z13, z15 T01 and z15 T02 as these systems are not connected to one another. This is similar for STP. If there is a communication issue with a bridge system, the backup time server (BTS) may not

take over or you may not be able to configure a BTS due to the lack of connectivity to the other systems. This risk can be mitigated by having two bridge systems in the environment, but it doesn't eliminate the risk. Therefore, clients should get the environment to a point where all systems can connect to each other so they're in the most redundant environment as possible.