

## 4.5.2 Integrated Coupling Adapter (FC 0172)

Introduced with IBM z13, the IBM ICA SR is a two-port fanout feature that is used for short distance coupling connectivity and uses channel type CS5.

The ICA SR uses PCIe Gen3 technology, with x16 lanes that are bifurcated into x8 lanes for coupling. No performance degradation is expected compared to the coupling over InfiniBand 12x IFB3 protocol.

The ICA SR is designed to drive distances up to 150 m (492 ft) with a link data rate of 8 GBps. ICA SR supports up to four channel-path identifiers (CHPIDs) per port and eight subchannels (devices) per CHPID.

The coupling links can be defined as shared between images within a CSS. They also can be spanned across multiple CSSs in a CPC. Unlike the HCA3-O 12x InfiniBand links, the ICA SR cannot define more than four CHPIDS per port. When STP is enabled, ICA SR coupling links can be defined as timing-only links to other z14 and z13/z13s CPCs.

The ICA SR fanout is housed in the PCIe I/O fanout slot on the z14 CPC drawer, which supports 10 PCIe I/O slots. Up to 10 ICA SR fanouts and up to 20 ICA SR ports are supported on a z14 CPC drawer, enabling greater connectivity for short distance coupling on a single processor node compared to previous generations. The maximum number of ICA SR fanout features is 20 per system on IBM z14™ servers.

The ICA SR can be used for coupling connectivity between z14 and z13/z13s servers. It does not support connectivity to zEC12, zBC12 servers, and it cannot be connected to HCA3-O or HCA3-O LR coupling fanouts.

The ICA SR fanout requires cabling that different from the 12x IFB cables. For distances up to 100 m (328 ft), OM3 fiber optic can be used. For distances up to 150 m (492 ft), OM4 fiber optic cables can be used. For more information, see the following resources:

- ▶ *Planning for Fiber Optic Links*, GA23-1407
- ▶ *IBM 3906 Installation Manual for Physical Planning*, GC28-6965

## 4.5.3 HCA3-O (12x IFB) fanout (FC 0171)

The HCA3-O fanout for 12x InfiniBand provides an optical interface that is used for coupling links. The two ports on the fanout are dedicated to coupling links that connect to z14, z13, z13s CPCs. Up to 16 HCA3-O (12x IFB) fanouts are supported and provide up to 32 ports for coupling links.

The fiber optic cables are industry-standard OM3 (2000 MHz-km) 50-µm multimode optical cables with multifiber push-on (MPO) connectors. The maximum cable length is 150 m (492 ft). Each port (link) has 12 pairs of fibers: 12 fibers for transmitting, and 12 fibers for receiving. The HCA3-O (12xIFB) fanout supports a link data rate of 6 GBps.

**Important:** The HCA3-O fanout features two ports (1 and 2). Each port includes one connector for transmitting (TX) and one connector for receiving (RX). Ensure that you use the correct cables. An example is shown in Figure 4-5 on page 157.

For more information, see the following resources:

- ▶ *Planning for Fiber Optic Links*, GA23-1407
- ▶ *IBM 3906 Installation Manual for Physical Planning*, GC28-6965