

z/OS Container Extensions - Overview and Planning

0:01 Hello, this is Gus Kassimis. I'm the architect for z/OS Container Extensions, or zCX for short.

0:08 In this video, we're going to help you understand the hardware and software requirements for zCX.

0:13 In addition, we will provide some insights into system resources that are required to provision a zCX appliance instance.

0:20 As a reminder, zCX is a virtual appliance that enables the deployment of Linux on Z software packaged as docker images directly inside of the z/OS system without any modifications using standard Docker container interfaces.

0:36 A zCX appliance instance consists of a Linux kernel and a docker daemon that is deployed in a z/OS address space.

0:44 Multiple containers can be deployed in a single zCX instance and they can communicate with native z/OS applications using standard TCP/IP communications over a high-speed virtual networking interface.

0:58 You can deploy multiple zCX instances, or address spaces, inside of a z/OS system.

1:04 zCX enables co-location of relevant workloads in z/OS for an expanded z/OS software ecosystem.

1:12 For a high-level overview of what z/OS Container Extensions is, watch our zCX overview video.

1:20 We are going to start by establishing the hardware and software requirements for zCX.

1:26 zCX requires an IBM z15 or z14 server with a container hosting foundation feature, feature code 0104.

1:37 How about software requirements? zCX is a key new feature of the z/OS V2R4 release. So, you will need to upgrade to this release in order to deploy zCX.

1:49 Finally, it is required that you have z/OSMF configured and running on your system, as zCX instances are provisioned using z/OSMF workflows.

1:59 These workflows provide a recipe for automatically provisioning a custom zCX instance in just a few minutes.

2:07 Now that we have established the hardware and software requirements, we need to understand what resources are required to provision a zCX appliance instance.

2:16 Please note that by deploying more than one instance of zCX, you will need to plan for the resources for each instance.

2:25 zCX is a virtual Linux system and as such requires the following resources: processors, memory, storage, and finally the networking resources.

2:39 Let's look at each one of these in detail.

2:43 zCX is a Linux based appliance with virtual processors that can be dispatched on any z/OS processors that includes: zIIP Processors or General Purpose Processors.

2:57 Determine the number of processors that a zCX instance is able to use, a minimum of 1 is required by at least two or more are recommended.

3:06 zCX can use up to the number of processors available to the z/OS system.

3:10 Note that these virtual processors are not exclusive to zCX.

3:14 They are shared with other workloads within your z/OS system.

3:18 The z/OS Workload Manager can be used to govern and set priorities for your zCX workload versus other workloads on your system, and to determine whether zCX can exploit general purpose processors if zIIP processors are a constraint.

3:35 Next, let's take a look at memory.

3:37 zCX requires fixed memory. This memory is dedicated to each zCX instance and is private memory that resides above the 2 gigabyte bar.

3:46 A minimum of 2 gigabytes is required but more is recommended and will be needed depending on the workload you are running.

3:53 It is recommended that you configure enough memory to minimize swapping and optimize performance.

3:58 You should ensure that your z/OS system has this much memory freed and available for zCX use before provisioning.

4:06 This memory will be dedicated to zCX once the zCX instance is started.

4:12 Each zCX instance will require multiple Linux disks, each with its own purpose.

4:17 These are implemented as z/OS VSAM linear datasets that are exclusively allocated to each zCX instance.

4:25 Datasets are fully allocated at provisioning time and most require primary extents only.

4:31 A DATACLASS with extended format required and Extended Addressability enabled is needed to allow for greater than 4 gigabytes datasets to be allocated.

4:41 Let's examine each type of disk needed and their storage requirements.

4:47 The root disk holds the Linux root file system and its minimum size is 4 gigabytes.

4:54 The configuration disk holds configuration data for the zCX appliance. Its minimum size is 2 megabytes.

5:01 The user data disks hold all docker images, containers, logs, and volumes. There's a size default recommended of at least 20 gigabytes to get started but this will be workload dependent.

5:15 This is where all of your applications, packages, dockers, containers will basically store their persistent data.

5:22 Swap data disks get used by the Linux kernel for paging/swapping when virtual memory exceeds real memory.

5:30 The minimum size we recommend is 2 gigabytes, but this is a value that is workload dependent and will depend on the virtual and real storage requirements of the docker containers that you deploy within zCX.

5:42 The DLOG data disks are used to hold diagnostic data, logs, and first failure data capture information. The minimum size is 1 gigabyte.

5:52 The alternate root disk is used when maintenance or service is applied via the upgrade z/OSMF workflow as an alternative Linux root files system is created. its minimum size is 4 gigabytes.

6:07 The instance zFS is used to hold zCX appliance image, configuration file, and first failure data capture information. Its minimum size is 4 gigabytes.

6:18 What about networking? Each zCX instance requires an IP address that is defined as a special z/OS Dynamic Virtual IP address, DVIPA, in a z/OS TCP/IP profile.

6:31 You'll also need to specify the hostname for the zCX appliance and configuration information from the Domain Name Servers to be used by the appliance.

6:39 zCX does not require any new network adapters like OSA-Express or HiperSockets.

6:44 A virtual high-speed network connection, referred to as EZAZCX, between zCX and the z/OS TCP/IP stack is used to route traffic to and from zCX without requiring additional networking interfaces.

6:58 Just in case you weren't taking down notes, let me try to summarize the minimum recommended resources for deploying a zCX instance.

7:06 We need two shared zIIP or general purpose processors, 4 gigabytes of fixed memory, around 35 gigabytes of DASD space, and 1 IPv4 dynamic virtual IP address, or DVIPA.

7:20 We hope this has established a high-level understanding of the required resources needed to provision a zCX appliance instance.

7:28 For more details on each of these areas and how to define and configure these resources, download the zCX technical guide from the z/OS knowledge center.

7:38 And to learn more on how to provision a zCX appliance once you have configured the necessary resources, watch our Provisioning zCX with the z/OSMF workflow video. Thank you for watching.

