

MANAGEMENT AND MONITORING OF DATABASE SPECIFIC LINUX CONTAINERS MADE EASY

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LINUX(LXC) CONTAINER

◉ WHAT IS LXC CONTAINER

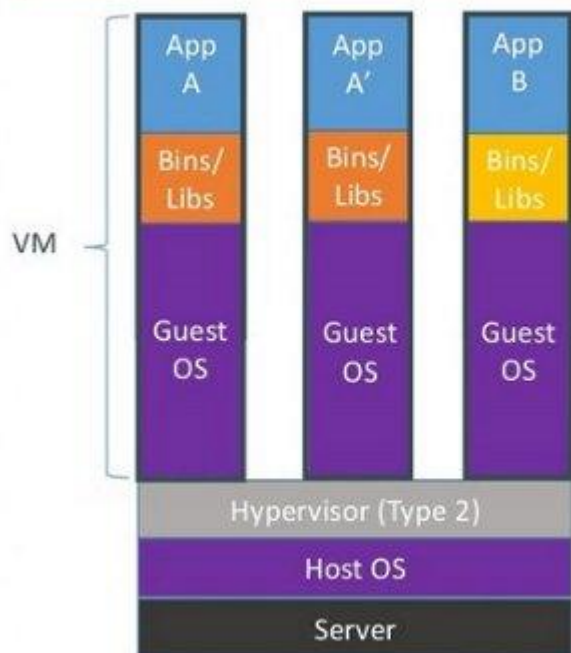
Linux Containers (LXC) is an operating system-level virtualization method for running multiple isolated Linux systems (containers) on a single control host (LXC host). It does not provide a virtual machine, but rather provides a virtual environment that has its own CPU, memory, block I/O, network, etc. space.

◉ FEATURES

- Lightweight and resource-friendly
- Comprehensive process and resource isolation
- Run multiple versions of an operating system on a single server
- Rapid and Easy deployment

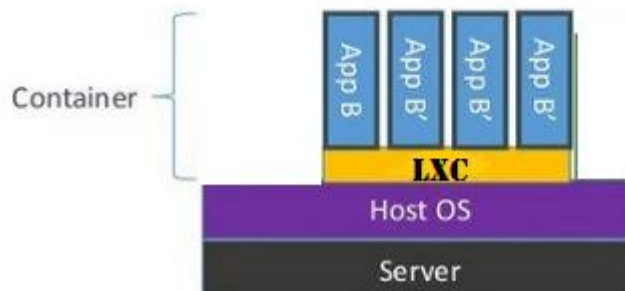
CONTAINER VS VIRTUAL MACHINE

Containers vs. VMs



Containers are isolated, but share OS and, where appropriate, bins/libraries

...result is significantly faster deployment, much less overhead, easier migration, faster restart



RESOURCE PROVISIONING & INSTANCE CAGING

- ◉ What does it mean in LXC Containers
- ◉ Feature used to provide Resource Provisioning - Cgroups
- ◉ Concept of Resource Caging is Applied due to server consolidation
- ◉ Partitioning Approach is used in Instance Caging

APPLICATION

- ◉ PROCESS ISOLATION
- ◉ SANDBOXING (TESTING)
- ◉ RESOURCE MANAGEMENT

PROTOTYPE - WITHOUT RESOURCE PROVISIONING

```
rashmi@rashmi-Lenovo-Z580: ~  
top - 15:41:22 up 4:28, 2 users, load average: 3.97, 1.55, 0.84  
Tasks: 23 total, 5 running, 18 sleeping, 0 stopped, 0 zombie  
%Cpu(s): 99.4 us, 0.6 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st  
KiB Mem: 3907200 total, 3480112 used, 427088 free, 622552 buffers  
KiB Swap: 4054012 total, 0 used, 4054012 free. 1297852 cached Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1874	ubuntu	20	0	9260	3344	1468	R	82.6	0.1	1:21.71	matho-primes
1876	ubuntu	20	0	9260	3368	1484	R	79.6	0.1	1:13.04	matho-primes
1877	ubuntu	20	0	9260	3536	1660	R	77.6	0.1	1:08.33	matho-primes
1875	ubuntu	20	0	9260	3368	1484	R	76.6	0.1	1:16.53	matho-primes
1698	mysql	20	0	484460	48592	10448	S	74.6	1.2	0:35.40	mysqld
1	root	20	0	33120	3632	2628	S	0.0	0.1	0:00.27	init
509	root	20	0	15264	200	0	S	0.0	0.0	0:00.04	upstart-socket-
1447	root	20	0	19480	184	0	S	0.0	0.0	0:00.03	upstart-udev-br
1479	root	20	0	49276	3204	2780	S	0.0	0.1	0:00.00	systemd-udev
1505	root	20	0	15280	232	0	S	0.0	0.0	0:00.01	upstart-file-br
1508	syslog	20	0	255848	8916	2344	S	0.0	0.2	0:00.00	rsyslogd
1542	root	20	0	10236	3252	956	S	0.0	0.1	0:00.00	dhclient
1614	root	20	0	12792	1952	1800	S	0.0	0.0	0:00.00	getty
1617	root	20	0	12792	1972	1816	S	0.0	0.1	0:00.00	getty
1618	root	20	0	12792	1896	1744	S	0.0	0.0	0:00.00	getty
1631	root	20	0	61372	5244	4572	S	0.0	0.1	0:00.00	sshd
1670	root	20	0	63136	2868	2400	S	0.0	0.1	0:00.01	login
1672	root	20	0	63136	2892	2424	S	0.0	0.1	0:00.02	login
1681	root	20	0	23660	2116	1908	S	0.0	0.1	0:00.00	cron
1835	ubuntu	20	0	21092	3748	3236	S	0.0	0.1	0:00.00	bash
1864	ubuntu	20	0	21092	3824	3304	S	0.0	0.1	0:00.00	bash
1879	ubuntu	20	0	103148	4576	3872	S	0.0	0.1	0:00.00	mysql
1881	ubuntu	20	0	22728	2876	2528	R	0.0	0.1	0:00.02	top

PROTOTYPE - WITH RESOURCE PROVISIONING

```
top - 15:52:45 up 4:39, 2 users, load average: 14.05, 11.25, 6.12
Tasks: 25 total, 5 running, 20 sleeping, 0 stopped, 0 zombie
%Cpu(s): 72.1 us, 3.2 sy, 0.0 ni, 24.3 id, 0.4 wa, 0.0 hi, 0.1 si, 0.0 st
KiB Mem: 3907200 total, 3724776 used, 182424 free, 624752 buffers
KiB Swap: 4054012 total, 0 used, 4054012 free. 1418740 cached Mem
```

PID	USER	PR	NI	VRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1698	mysql	20	0	550192	53524	10448	S	200.2	1.4	13:21.38	mysqld
15529	ubuntu	20	0	9260	3396	1504	R	0.6	0.1	0:00.86	matho-prin+
15535	ubuntu	20	0	9260	3396	1504	R	0.6	0.1	0:00.86	matho-prin+
15540	ubuntu	20	0	9260	3376	1492	R	0.6	0.1	0:00.86	matho-prin+
15545	ubuntu	20	0	9260	3360	1476	R	0.6	0.1	0:00.86	matho-prin+
1	root	20	0	33120	3632	2628	S	0.0	0.1	0:00.28	init
509	root	20	0	15264	200	0	S	0.0	0.0	0:00.04	upstart-so+
1447	root	20	0	19480	184	0	S	0.0	0.0	0:00.03	upstart-ud+
1479	root	20	0	49276	3212	2780	S	0.0	0.1	0:00.01	systemd-ud+
1505	root	20	0	15280	232	0	S	0.0	0.0	0:00.01	upstart-fi+
1508	syslog	20	0	255848	8916	2344	S	0.0	0.2	0:00.00	rsyslogd
1542	root	20	0	10236	3252	956	S	0.0	0.1	0:00.00	dhclient
1614	root	20	0	12792	1952	1800	S	0.0	0.0	0:00.00	getty
1617	root	20	0	63136	2912	2444	S	0.0	0.1	0:00.00	login
1618	root	20	0	12792	1896	1744	S	0.0	0.0	0:00.00	getty
1631	root	20	0	61372	5244	4572	S	0.0	0.1	0:00.00	sshd
1670	root	20	0	63136	2868	2400	S	0.0	0.1	0:00.01	login

THANK YOU