

# IBM LinuxONE Rockhopper II

## Overview



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Value proposition

Product overview

Use cases / success stories

Introducing the  
Newest  
Members of the  
IBM Z and  
LinuxONE  
Families



IBM z14  
Model ZR1

IBM LinuxONE  
Rockhopper II

Fast.  
Strong.  
Secure.  
Cloud Ready.

# Designed and developed using IBM Design Thinking and IBM Offering Management discipline

- Proof of Concept in early 2015, incorporating customer feedback
- IBM received approximately 900 mainframe patents in 2017 and has over 1,500 pending patent applications that relate to mainframe technologies
- Ongoing stakeholder interviews with customers of all sizes, applications, users, business partners, and geographies
  - Collaborated with more than 150 customers for the z14 M01-M05 and Emperor II models
  - Collaborated with an additional 80 customers for the z14 ZR1 model and Rockhopper II
- February 2018, began early hardware user experience testing with over 10 internal and external customers



# Common architectures, different packaging and markets



**Common Architecture**

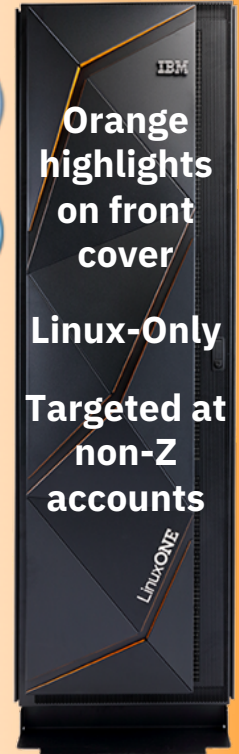
**Platform Simplification**

**Processor Units (PUs)**

**Memory**

**I/O**

**PR/SM or IBM Dynamic Partition Manager**







**Unparalleled  
engineering for  
data serving**



**Unmatched  
security & privacy**



**Unrivaed  
economics at scale**

**LinuxONE**

# Introducing the IBM® LinuxONE™ Rockhopper™ II

- Up to 30 cores (50% more than previous gen), equivalent to 180-240 x86 cores
- Up to 8 TB memory (2x previous gen)
- I/O support for up to 2 million IOPS, 128 GBps
- 19" industry standard form factor
- Optional 16U of available frame space for additional components, e.g., storage, server, network switch
- PDU-based with 200v-240v power
- Air-cooled only

Machine Type: 3907  
Model: LR1



"Bare Metal"  
(on LPAR)



z/VM



vRealize  
Automation

# Unmatched security and privacy

The world's premier Linux® system  
for highly secured  
data & cloud serving

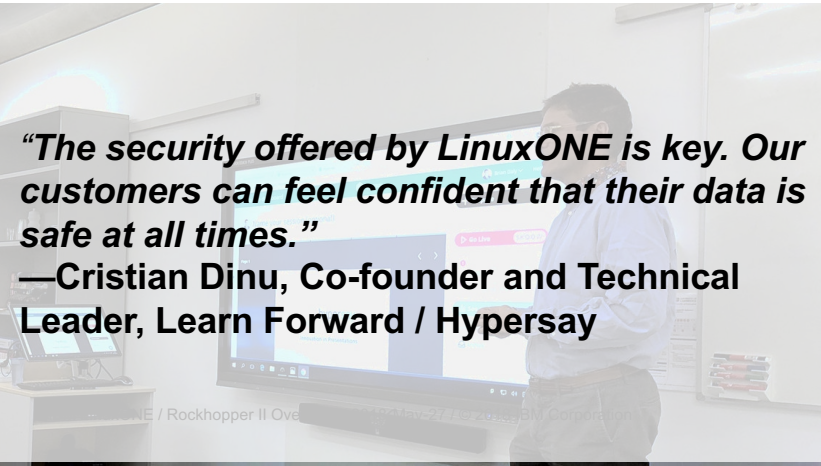
- Encryption at rest and in flight
- Industry-leading multi-tenant isolation
- FIPS 140-2 Level 4 certification
- Industry-unique IBM Secure Service Container



Redefining the security  
perimeter for the next  
generation of applications

IBM LinuxONE™ offers  
Secure Service Containers  
to protect against:

- Threats to data privacy
- Stolen credentials
- Malware / ransomware
- Database manipulation



*“The security offered by LinuxONE is key. Our customers can feel confident that their data is safe at all times.”*

—Cristian Dinu, Co-founder and Technical Leader, Learn Forward / Hypersay

# Common capabilities available across all LinuxONE models

## I/O

FICON Express16S+  
OSA-Express 6S  
Crypto Express6S  
zEDC Express,  
RoCE Express2  
zHPF

## RAIM memory

## HiperSockets™

## Security

In-core crypto (CPACF),  
Crypto Express6S, GCM  
Encryption (Java™), TKE

## Pause-less garbage collection

## SIMD

## SMT

## IBM Dynamic Partition Manager (DPM)

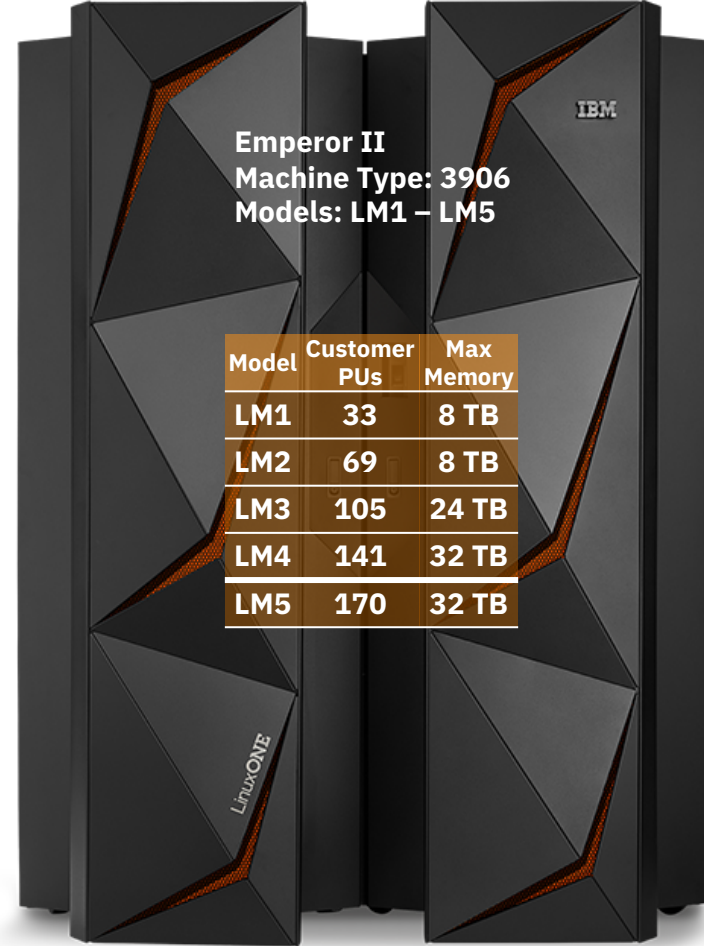
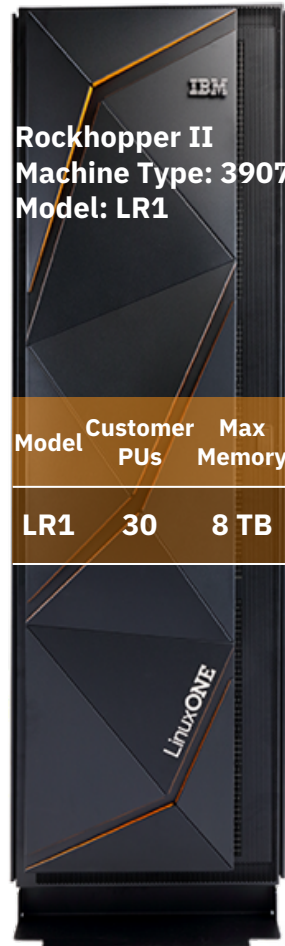
## IBM Secure Service Container capable

## On-chip compression

## Physical planning

- Overhead (top exit) cabling and power
- ASHRAE A3

## HMC Mobile app



# A new opportunity to build an “all in one” solution for greater efficiency

New to the platform with Rockhopper II

With smaller I/O configurations – a new 16U Reserved feature code can be added that tags 16U of space in rack as “Available” for customer use

This creates **a new opportunity** to build a fully customized, comprehensive solution to meet your infrastructure needs

Populate with your choice of server, switch or storage elements <sup>1</sup>

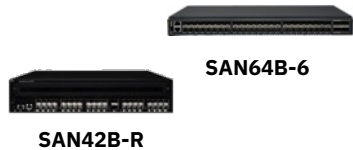
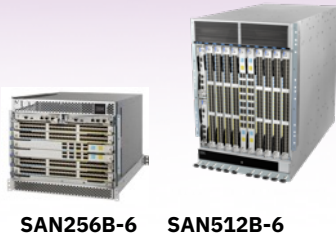
<sup>1</sup> Hardware service to IBM or non IBM options may be provided by a 3<sup>rd</sup> party – but they must be able to provide analysis of power, thermal, air flow and other requirements as listed in the IMPP guide. Requirements for physical structures as well as interactions with the ‘mainframe server’ will be provided





# IBM LinuxONE and Storage synergy

## Storage Networking



## Flash and Hybrid Storage Systems

z/VM, LinuxONE (FCP only)



FlashSystem™  
A9000



Storwize®  
V7000 / V7000F



FlashSystem  
V9000



FlashSystem  
FS900



DS8880

Other examples of uses for 16U Reserved space include IBM 1U HMC, IBM TKE, IBM Power Systems™, NVMe

# Met Office

## Ensuring timely delivery of essential weather data to millions of customers

The Met Office migrated its meteorological databases from x86 systems to a resilient, high-performance and scalable IBM® LinuxONE platform—ensuring it can handle massive peaks in requests.

A single team supports a large number of core Linux apps  
Cuts operational costs through database consolidation  
Ensures millions of customers can access critical weather data 24x7

*“We can bet the business on LinuxONE—and I can sleep easily in the knowledge that we can absolutely rely on our data delivery systems.”*

*Graham Mallin, Executive Head of Technology at the Met Office*





## Secure Data Serving

*“As we continue to expand our business, LinuxONE helps ensure that there's no impact on performance, reliability and security ... We don't see any convincing rivals to LinuxONE ... ”*

Jeffrey Pochily, VP of Network Infrastructure

**\$1B**

cumulative savings delivered to the healthcare industry

**20M**

members onboarded in one year with zero performance impact

**1 in 7**

US citizens served with potentially life saving analytics







the **plasticbank**



and

are tackling ocean plastic  
and global poverty with

**IBM LinuxONE**

*“Thanks to IBM, we are transforming the lives of millions of the most disadvantaged people on earth, and realizing our vision for cleaner oceans.”* David Katz, CEO, The Plastic Bank

# IBM LinuxONE Rockhopper II



For more customer stories:

<https://www.ibm.com/linuxone/success-stories>

Collaboratively Designed

Fits in any data center

Highly engineered to be  
resilient, fast & secure

The premier platform for secure  
cloud and data serving

<https://www.ibm.com/marketplace/linuxone-rockhopper-ii>



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# IBM LinuxONE and Storage synergy

*Designing, developing and testing together is key to unlocking true value*

	Connectivity to LinuxONE	Virtualization supported	Comments
IBM System Storage® DS8880	FICON, FCP	z/VM	<ul style="list-style-type: none"><li>• zHPF and Extended Address Volumes</li><li>• GDPS®/PPRC HyperSwap®<sup>1</sup></li><li>• FICON Express16S+ with Forward Error Correction Codes, FICON Dynamic Routing, Read Diagnostic Parameters, Enhanced Write Protocol</li></ul>
TS7700	FICON	z/VM	
TS1150, TS4500	FICON, FCP	z/VM	<ul style="list-style-type: none"><li>• Support for z/VM via FICON if TS7700 is front end</li></ul>
IBM FlashSystem A9000/A9000R	FCP	KVM, z/VM	
Storwize® V7000/V7000F	FCP	KVM, z/VM	
SVC	FCP	KVM, z/VM	
IBM FlashSystem V9000	FCP	KVM, z/VM	
IBM FlashSystem 900	FCP	KVM, z/VM	

# IBM LinuxONE Operating system support for Emperor II and Rockhopper II

## Linux OS support:

### Minimum Distributions\*

- RHEL 7.3 with service update
- RHEL 6.9 with service update
- SLES 12 SP2 with service update
- SLES 11 SP4 with service update
- Ubuntu 16.04 LTS
- Ubuntu 18.04 LTS

## IBM z/VM

- z/VM® 6.4 with PTFs



## KVM supported

- KVM running on LinuxONE is offered by Linux distributions

\*Note: Listed support is for Emperor II and Rockhopper II, For minimum required distribution levels for all LinuxONE models see the IBM tested and supported Linux environments:

[ibm.com/it-infrastructure/z/os/linux-tested-platforms](https://ibm.com/it-infrastructure/z/os/linux-tested-platforms)

IBM cannot legally discuss Linux exploitation prior to GA from distributors.

IBM is working with the open source community and the Linux distribution partners to get new Rockhopper II functionality supported with Linux for Z

# IBM z14 ZR1 and LinuxONE Rockhopper II

## Processors

- New **feature-based sizing** (4, 12, 24, 30)
- PR/SM™ or IBM Dynamic Partition Manager
- 40 LPARs

## New entry level system

- z14 ZR1 has z/OS total capacity of more than 8000 MIPS
- Rockhopper II has Linux capacity of ~240 x86 cores

## Memory

- RAIM Memory design - Min of 64 GB - Max to 8 TB
- IBM Virtual Flash Memory (replaces Flash Express)

## I/O

- New PCIe Gen 3 IBM zHyperLink™ technology
- New ICA Coupling technology

## Platform Simplification

- New system design for Standardization of components – including Industry standard 19” rack
- 16U free space in frame

z14 Model ZR1  
LinuxONE Model LR1  
Machine Type: 3907

Model	Machine Type	Customer PUs	Max Memory
M05 LM5	3906	170	32 TB
M04 LM4	3906	141	32 TB
M03 LM3	3906	105	24 TB
M02 LM2	3906	69	16 TB
M01 LM1	3906	33	8 TB
<b>z14 ZR1, LR1</b>	<b>3907</b>	<b>4, 12, 24, 30</b>	<b>8 TB</b>