IBM Dynamic Partition Manager Introduction and News

_

Carl Mayer STSM | IBM Z Development

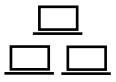


The power of the mainframe needs to be available to everyone, everywhere!

Today's Reality



Deep mainframe knowledge required



Several management endpoints



Complex platform management



No automatable dynamic provisioning



Even though I already had 10 years experience in POWER Systems and Storage, I had to start from zero understanding the Mainframe.

System Administrator, Retailer



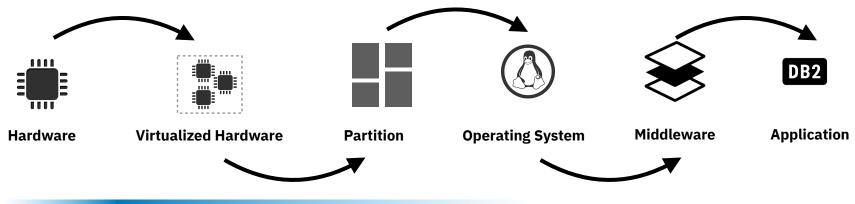
What if ...

... you were able to create a **new partition** including the **I/O configuration** within **10 minutes** through a **single management endpoint?**

IBM Dynamic Partition Manager

DPM is the simplification of virtual infrastructure* management and cloud enablement for IBM Z and LinuxONE.

^{*} processor, memory, I/O (i.e. network, storage, links), crypto, groups (i.e. Sysplex)



Dynamic Partition Manager

Providing the infrastructure resources to host the most mission critical workloads.

IBM Z | February 24, 2020 | © 2020 IBM Corporation

10

Dynamic Partition Manager

I/O Management

Create, View, Modify, Delete



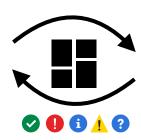




Network, Storage, Connections, Crypto

Partition Management

Create, View, Modify, Delete

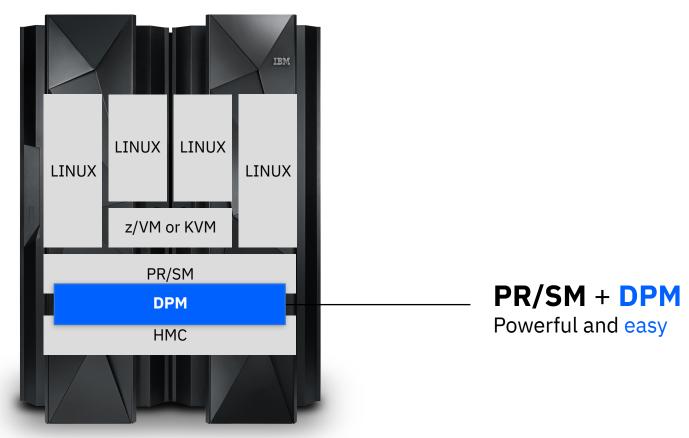


Deploying an Operating System

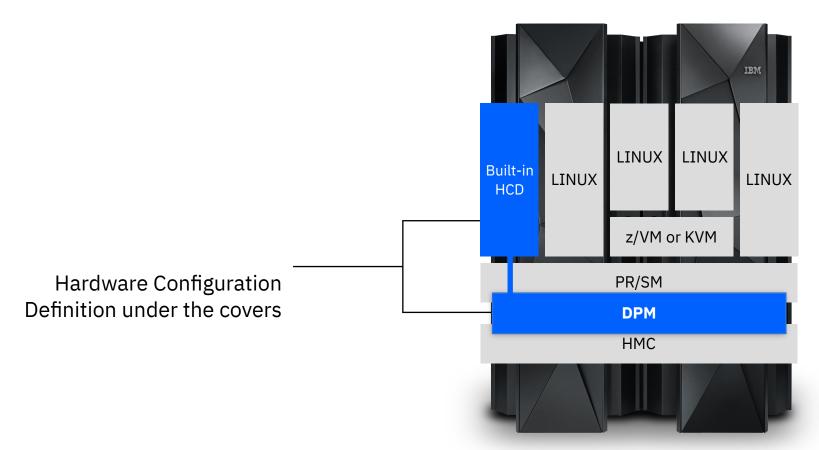


11

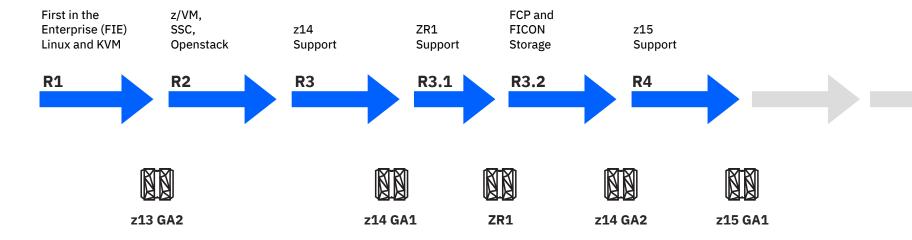
Under the Covers



Under the Covers



DPM Releases



It is intended to be the future default management experience.

Personas

If we aren't solving the right problem, we waste our time and our user's time.



I don't like to touch the I/O Configuration. One typo in the IOCDS and everything is gone.

System Administrator, Service Provider

Primary Personas



Shichi
Infrastructure / IT
Architect



EastonSenior System
Administrator



Adele Junior System Administrator

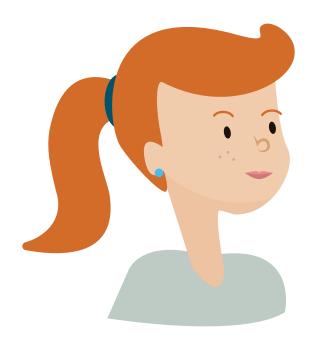


Zach Senior z/OS System Programmer



Christina
Junior z/OS System
Programmer

Adele



NOVICE SYSTEM ADMIN

Less than 5 years in systems management. General virtualization management skills. New to the IBM Z platform.

MAINFRAME EXPERIENCE



SKILLS



Sam



STORAGE ADMINISTRATOR

More than 10 years in storage management.

MAINFRAME EXPERIENCE



SKILLS

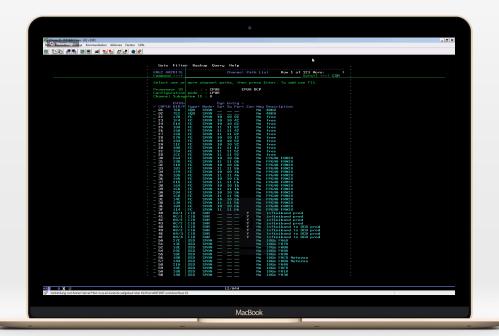


Building an end-to-end experience

TURN THIS

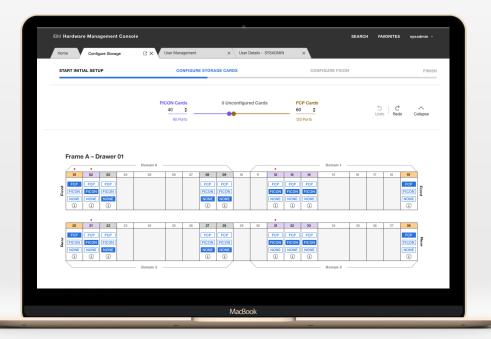
RESOURCE PARTITION=((LPA,1),(LPB,2),(LPC,3)) CHPID PATH=(10), SHARED, PARTITION=((LPA,LPB,LPC),(LPA,LPB,LPC)), SWITCH=01, TYPE=CTC CHPID PATH=(20), SHARED, PARTITION=((LPA, LPB, LPC), (LPA, LPB, LPC)), SWITCH=01, TYPE=CTC CUNUMBR=4010, PATH=(10), UNITADD=((00,008)), LINK=(2B), CUADD=1, UNIT=SCTC CUNUMBR=4020, PATH=(10), UNITADD=((00,008)), LINK=(2B), CUADD=2, UNIT=SCTC CUNUMBR=4030, PATH=(10), UNITADD=((00,008)), LINK=(2B), CUADD=3, UNIT=SCTC CUNUMBR=4210, PATH=(10), UNITADD=((00,008)), LINK=(45), CUADD=1, UNIT=SCTC CUNUMBR=4220, PATH=(10), UNITADD=((00,008)), LINK=(45), CUADD=2, UNIT=SCTC CUNUMBR=4230, PATH=(10), UNITADD=((00,008)), LINK=(45), CUADD=3, UNIT=SCTC ADDRESS=(4010,008),UNITADD=00,CUNUMBR=(4010),STADET=Y, IODEVICE ADDRESS=(4020,008),UNITADD=00,CUNUMBR=(4020),STADET=Y, PARTITION=(LPA, LPB, LPC), UNIT=SCTC IODEVICE ADDRESS=(4030,008), UNITADD=00, CUNUMBR=(4030), STADET=Y, PARTITION=(LPA, LPB, LPC), UNIT=SCTC IODEVICE ADDRESS=(5010,008),UNITADD=00,CUNUMBR=(5010),STADET=Y, PARTITION=(LPA, LPB, LPC), UNIT=SCTC IODEVICE ADDRESS=(5030,008), UNITADD=00, CUNUMBR=(5030), STADET=Y, PARTITION=(LPA, LPB, LPC), UNIT=SCTC IODEVICE ADDRESS=(4210,008),UNITADD=00,CUNUMBR=(4210),STADET=Y, MacBook

OR THIS

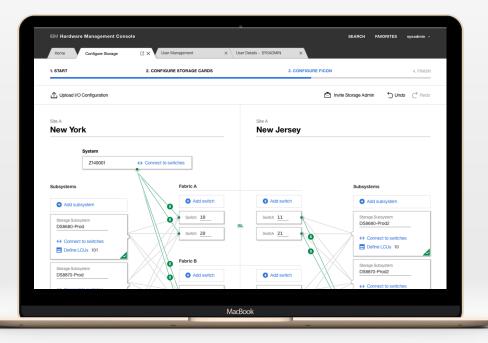


24

INTO THAT



AND THAT



easy

intuitive

automatic

smart

Six Universal Experiences



Discover, Try, and Buy

How do I get it?



Get Started

How do I get value?



Everyday Use

How do I get my job done?



Manage and Upgrade

How do I keep it running?



Leverage and Extend How do I build on it?



Support

How do I get unstuck?



27

Demo

Demo [Start]



A new Mainframe arrives.





It needs to be connected to the storage subsystems.

Essential Experiences

INITIAL SET-UP

Get Started

Configure Storage Cards

Configure FICON

Export Cabling Details

PRE-PROVISIONING

Regular Use

Storage Overview

Request Storage

Use Templates

STORAGE ATTACHMENT

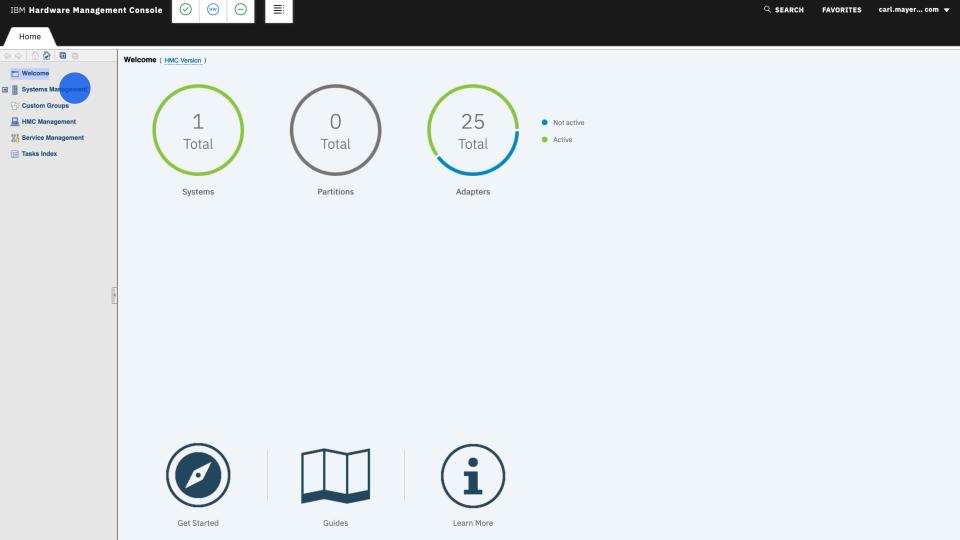
Regular Use and Get Help

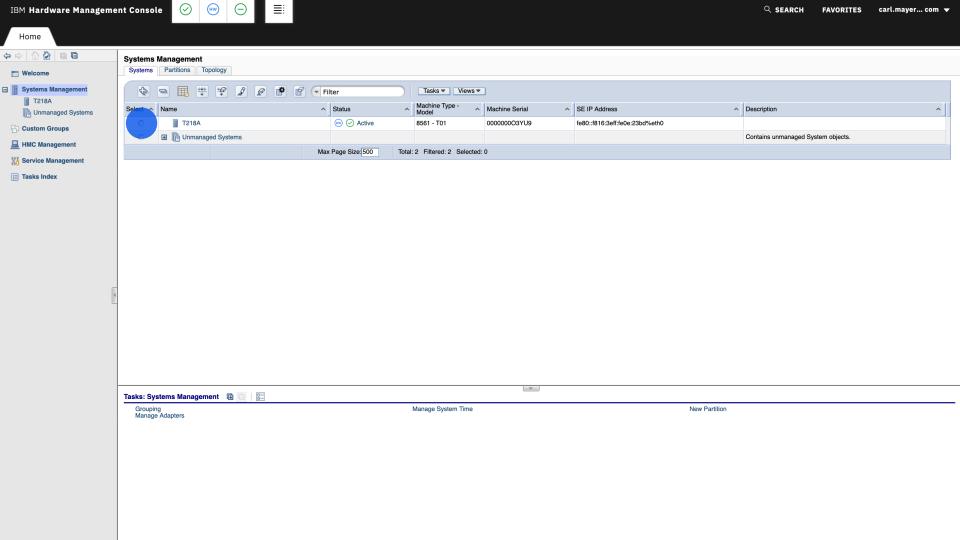
Create New Partition

Connection Report

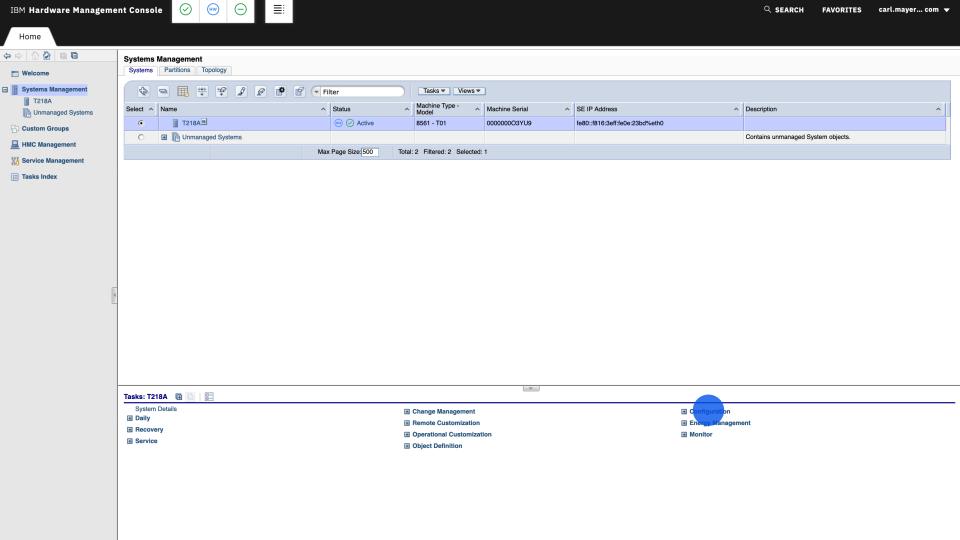
Login to the Hardware Management Console

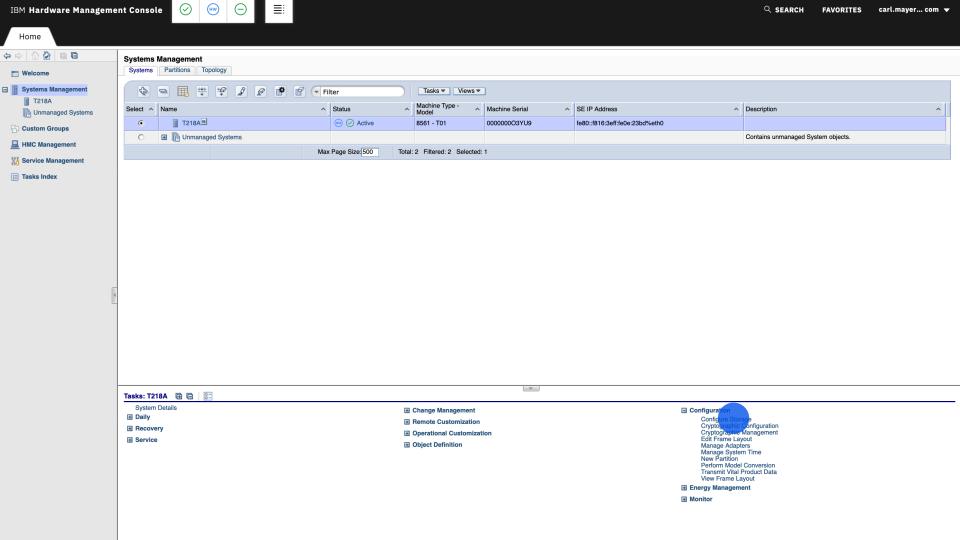
- \otimes Exceptions
- Hardware Messages
- Operating System Messages





Initial Setup







Q SEARCH

FAVORITES

carl.mayer... com ▼

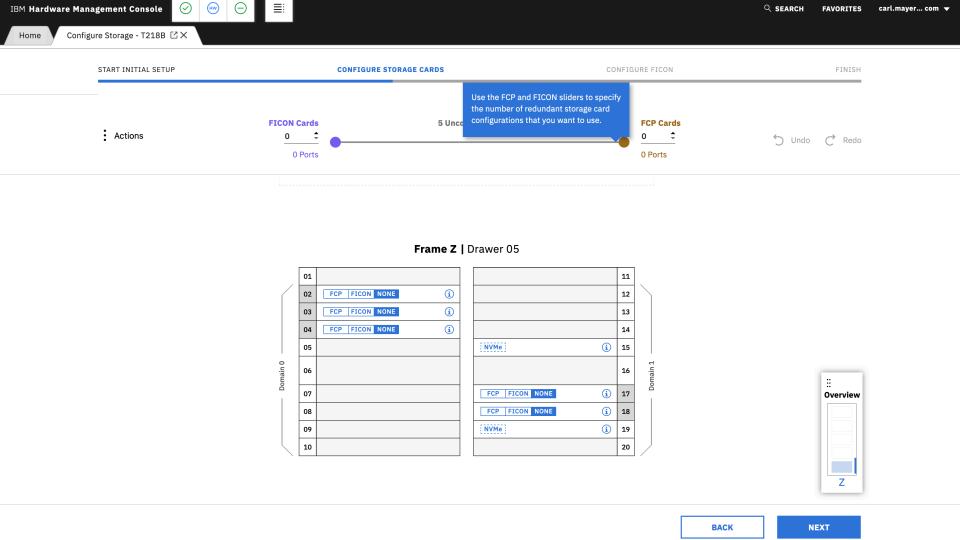
IBM Hardware Management Console

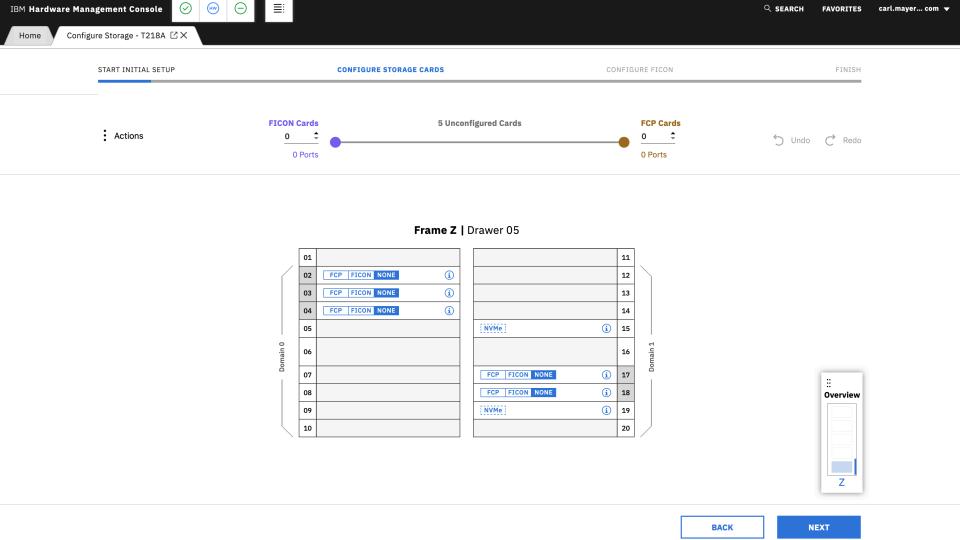
Connect System to Storage

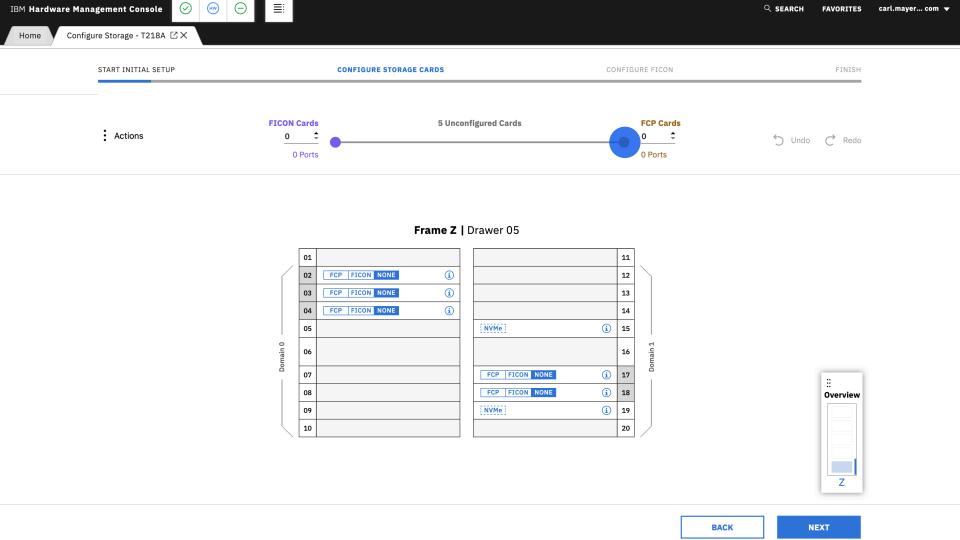
Configure from Scratch

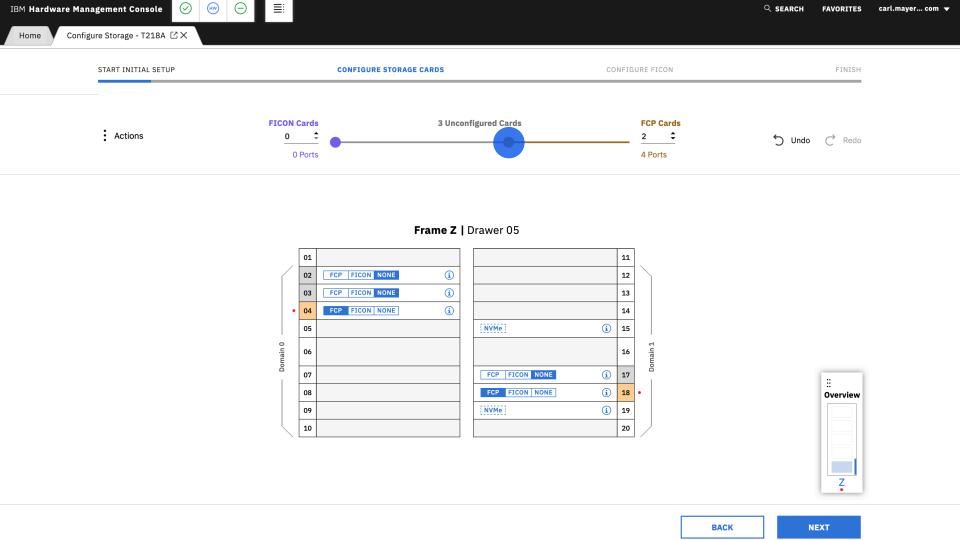
Start with a blank slate and connect your system to the storage environment.

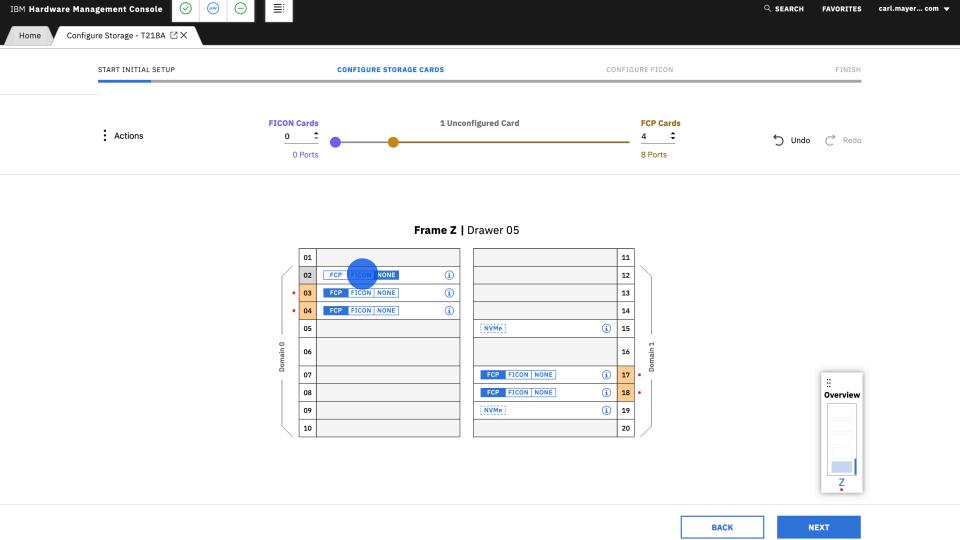


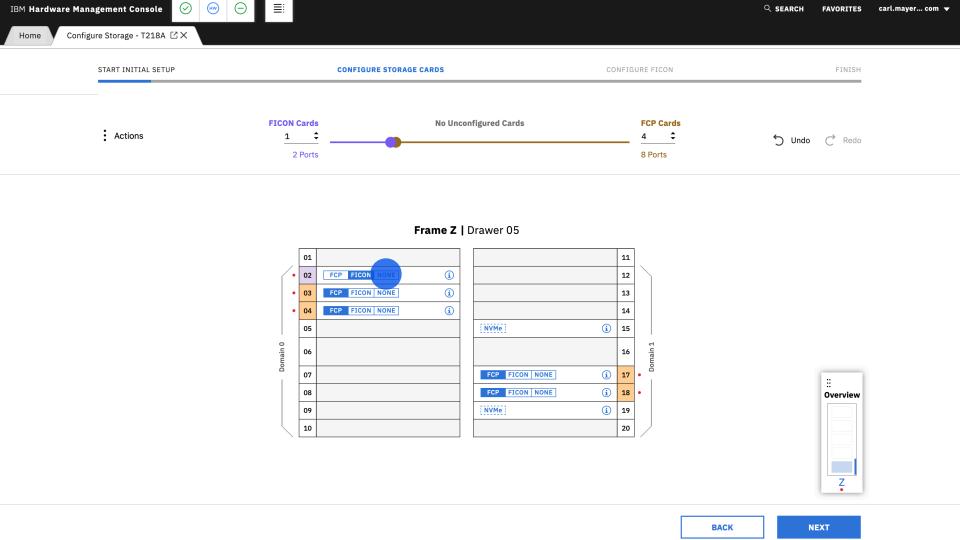


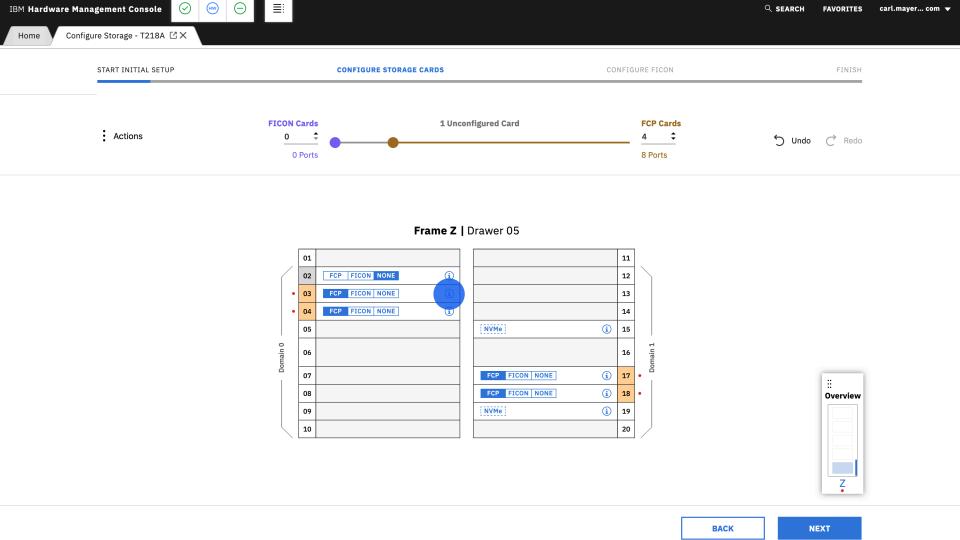


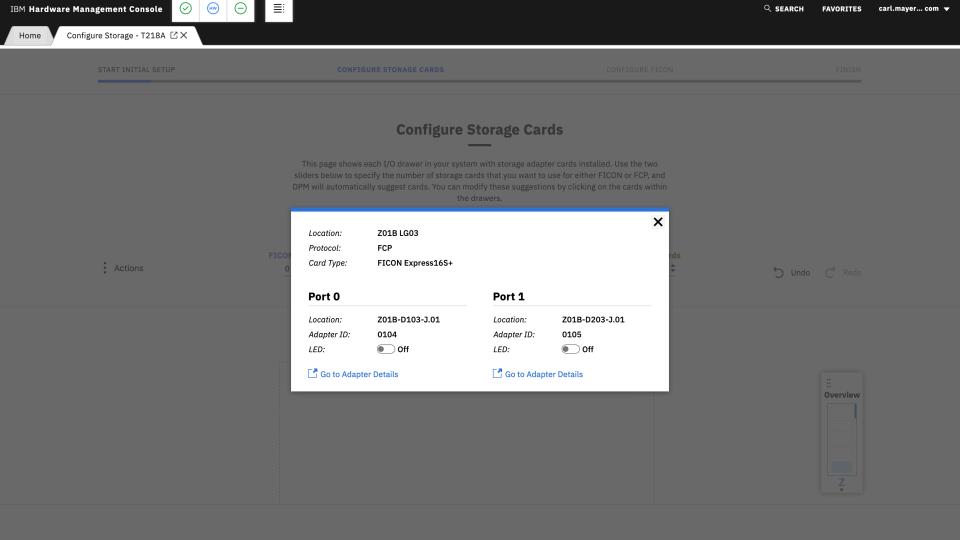


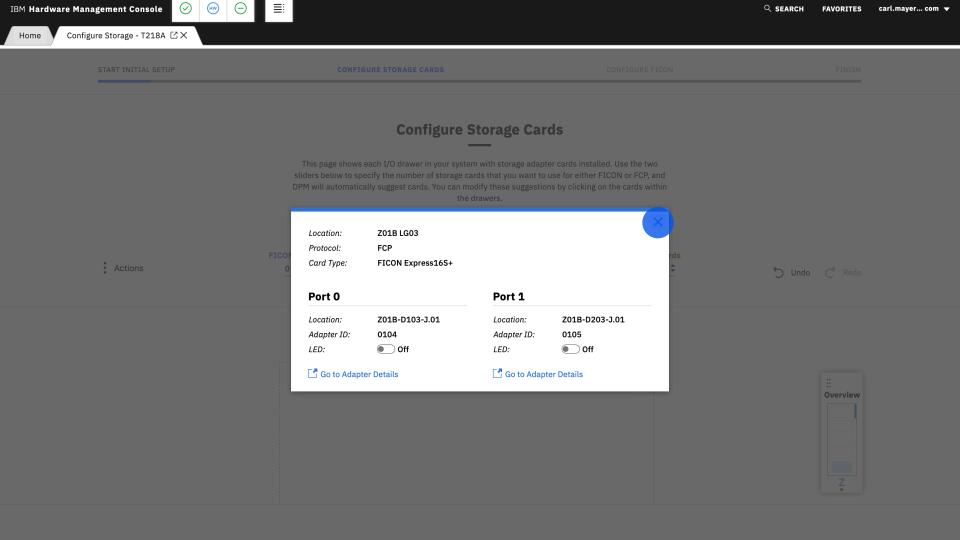


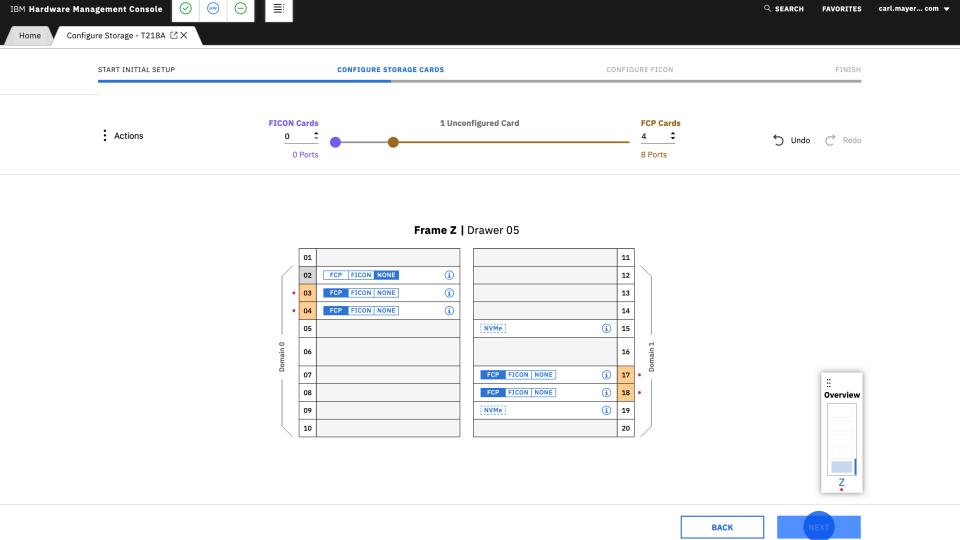












START INITIAL SETUP CONFIGURE FICON FINISH

Invite and Finish Initial Setup

You have configured the storage adapter cards and partially connected your system to storage. Invite at least one storage administrator to complete the setup.



Manually Invite Storage Administrator

Recommendation: Set up an SMTP server to send integrated email notification to your storage administrator next time.



丛 Download (TXT)



Copy to Clipboard

Please complete the FICON configuration for this system.

Please complete the FICON configuration for this system by using the Configure Storage task, which is a simplified way to connect DPMenabled systems to storage.

https://9.152.133.201:8443/hmc/remotectl/bonsai?operation=launchtask&taskid=prsm2.task.storage&targets=000000003YU9& deeplink=/storage/connectsystem/ficon

How to Configure Storage









How to Configure Storage









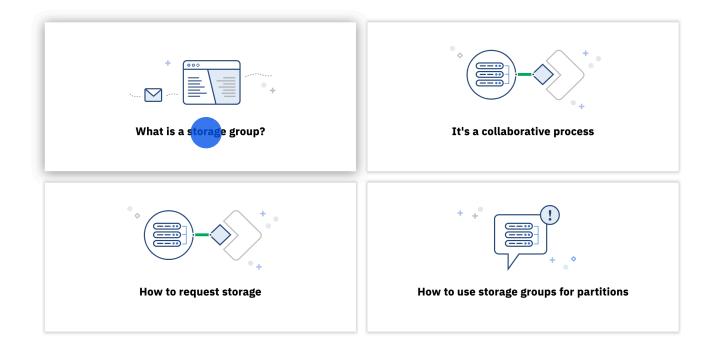
STORAGE OVERVIEW CREATE STORAGE GROUP

STORAGE CARDS

FICON CONNECTIONS

HELP

How to Configure Storage





▼ Configure Storage - T218A 🖾 🗙

Home

STORAGE OVERVIEW

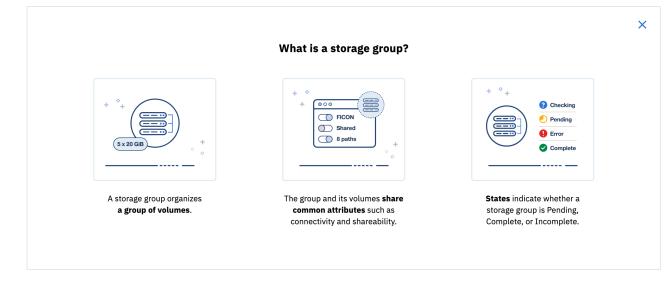
CREATE STORAGE GROUP

STORAGE CARDS

FICON CONNECTIONS

HELP

How to Configure Storage





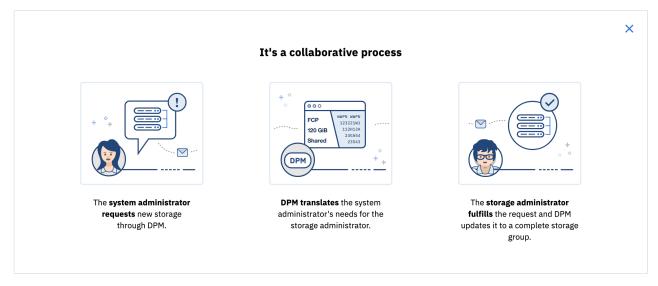
CREATE STORAGE GROUP

STORAGE CARDS

FICON CONNECTIONS

HELP

How to Configure Storage





STORAGE OVERVIEW

<

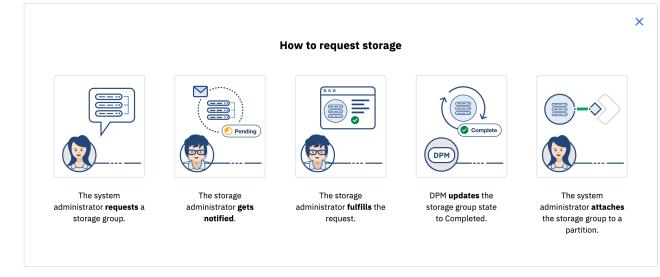
CREATE STORAGE GROUP

STORAGE CARDS

FICON CONNECTIONS

HELP

How to Configure Storage





▼ Configure Storage - T218A 🖾 🗙

Home

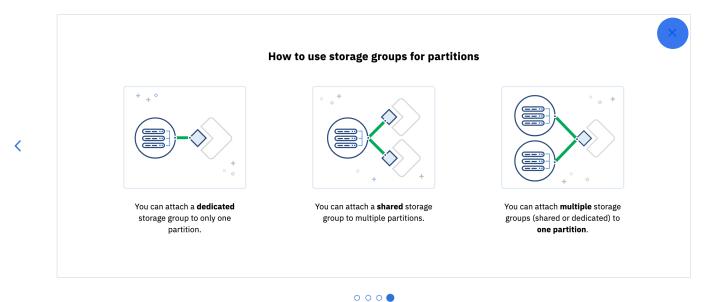
STORAGE OVERVIEW CREATE STORAGE GROUP

STORAGE CARDS

FICON CONNECTIONS

HELP

How to Configure Storage



STORAGE OVERVIEW

CREATE STORAGE GROUP

STORAGE CARDS

FICON CONNECTIONS

HELP

How to Configure Storage











Configure Storage - T218A ☐ X

Home

STORAGE OVERVIEW CREATE STORAGE GROUP

STORAGE CARDS

FICON CONNECTIONS

HELP

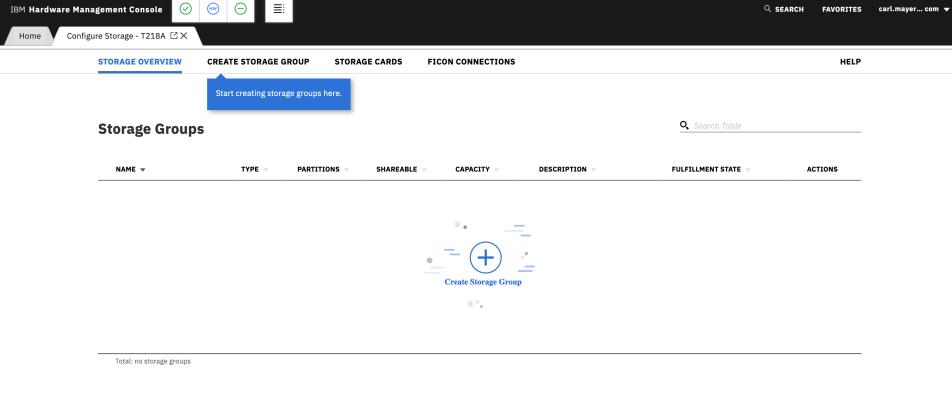
How to Configure Storage

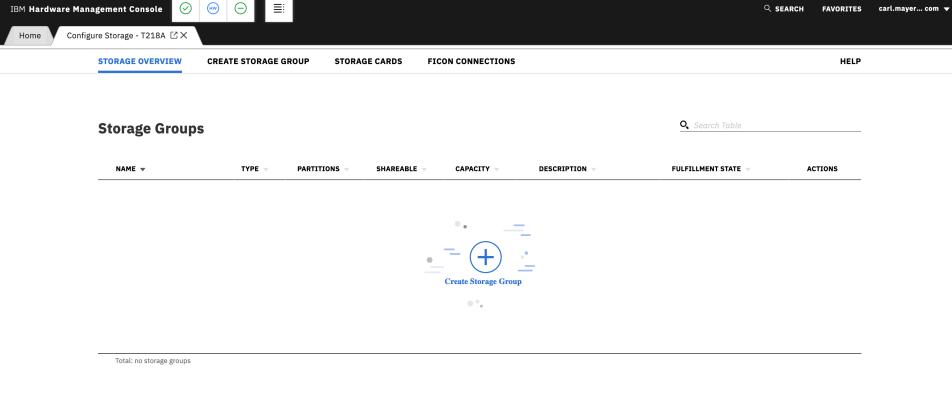












FICON Connections

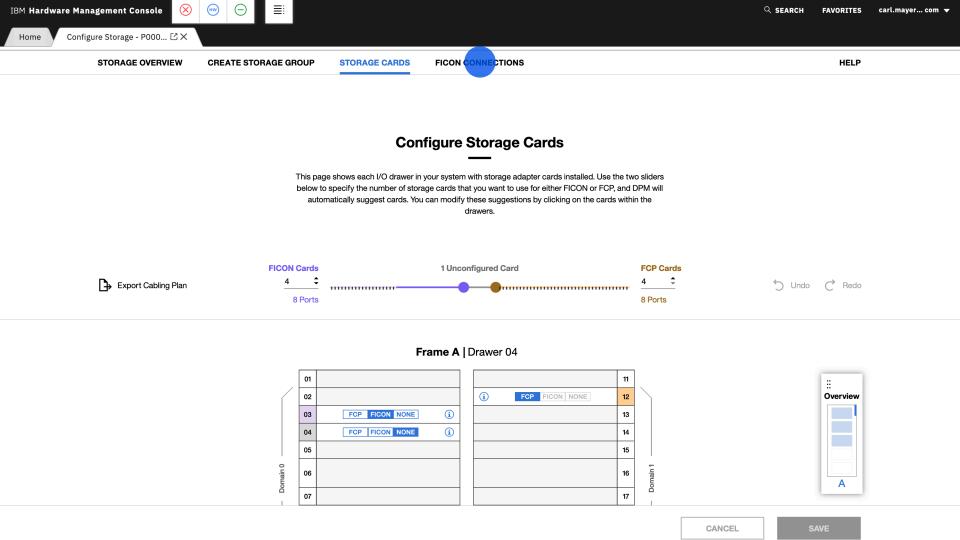


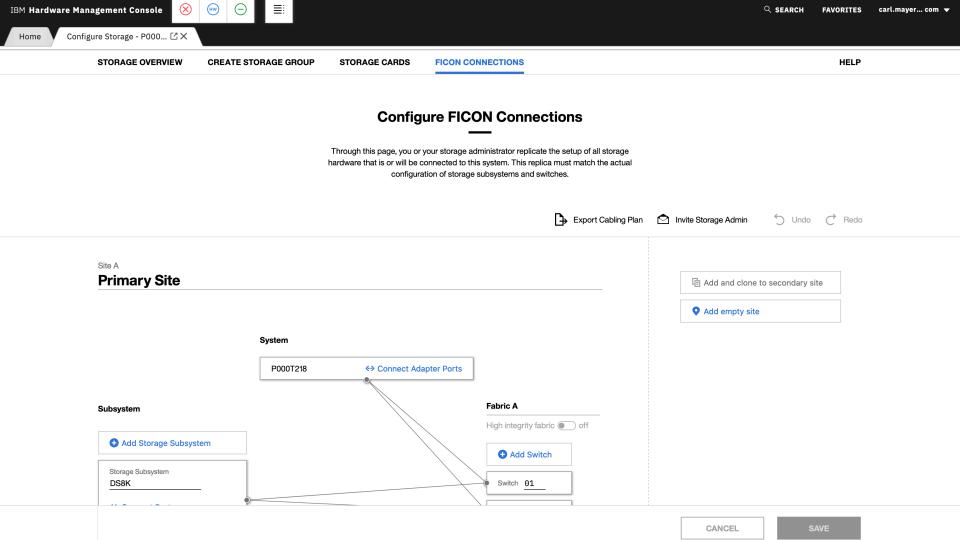
Storage Groups

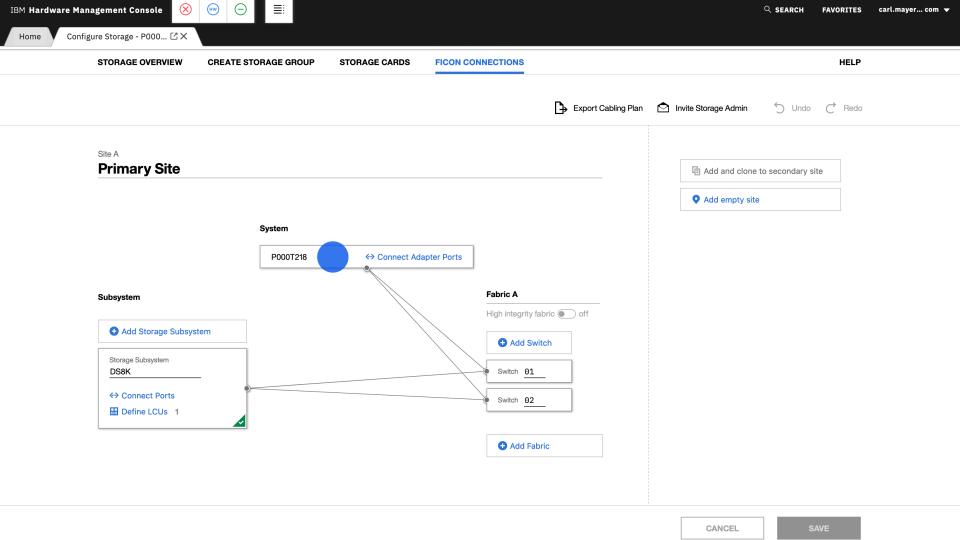


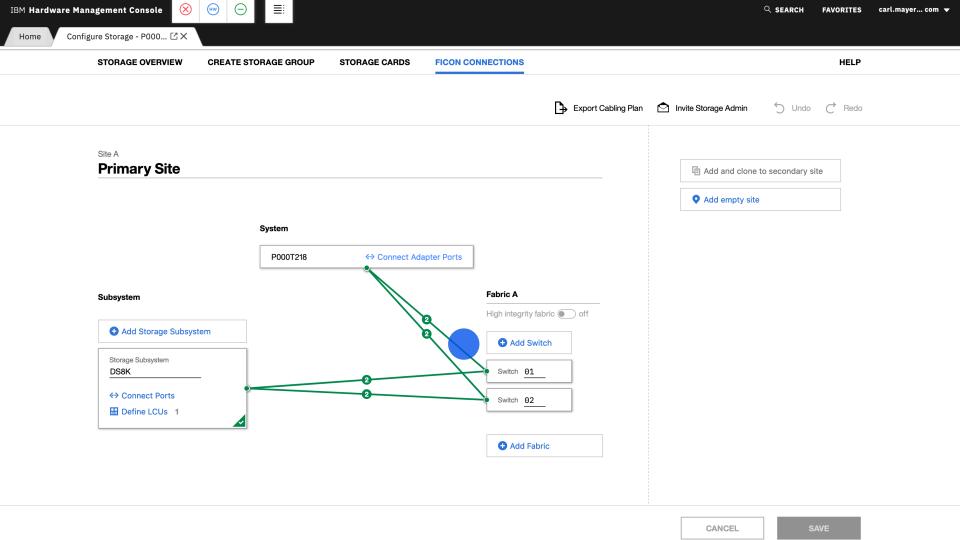
NAME ▼	TYPE	PARTITIO	NS V SHAREABLE V	CAPACITY V	DESCRIPTION V	FULFILLMENT STATE	ACTIONS
FICON for RHEL Boot	FICON	2	Shared	7.93 GiB		✓ Complete	•••
FCP for RHEL Boot	FCP	1	Dedicated	185 GiB	DO NOT DELETE OR MODIFY! T.	Complete	•••

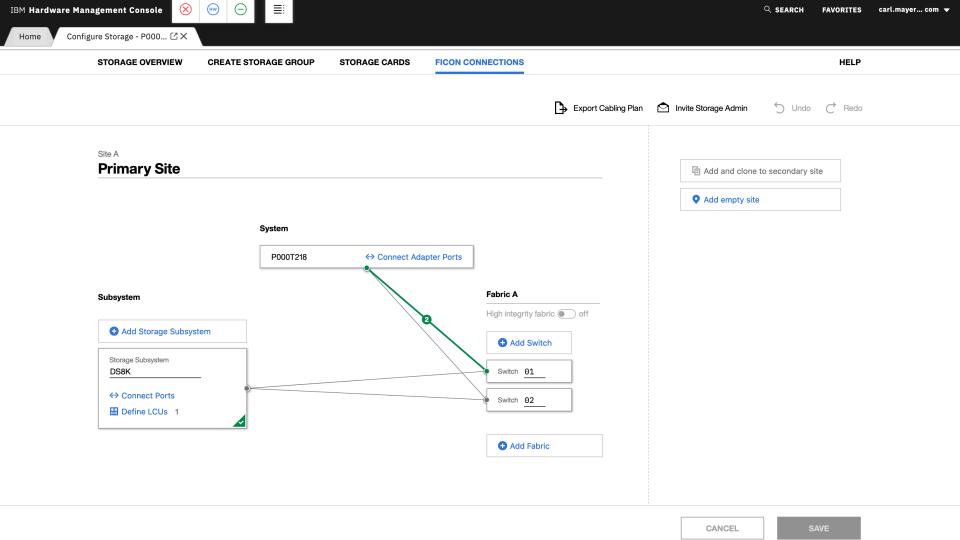
2 out of 4 storage groups shown

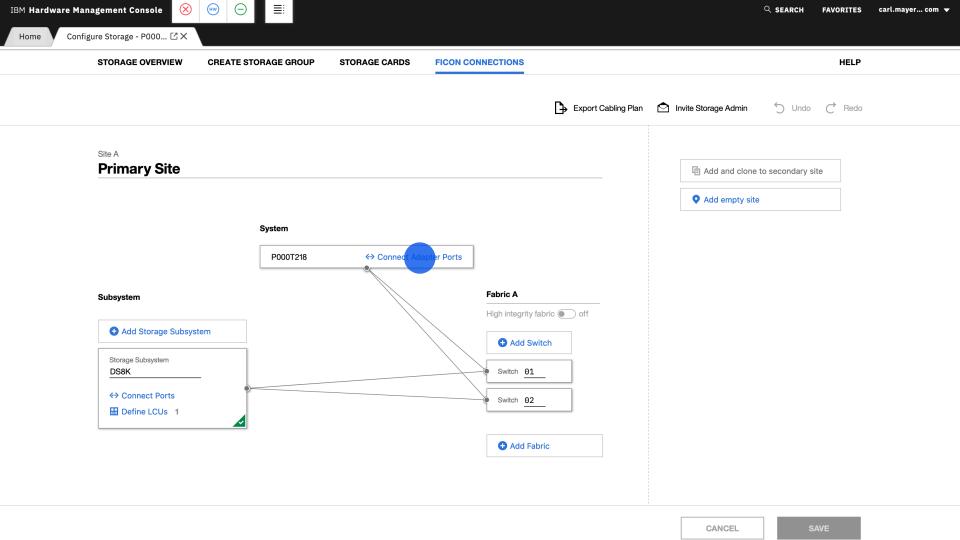


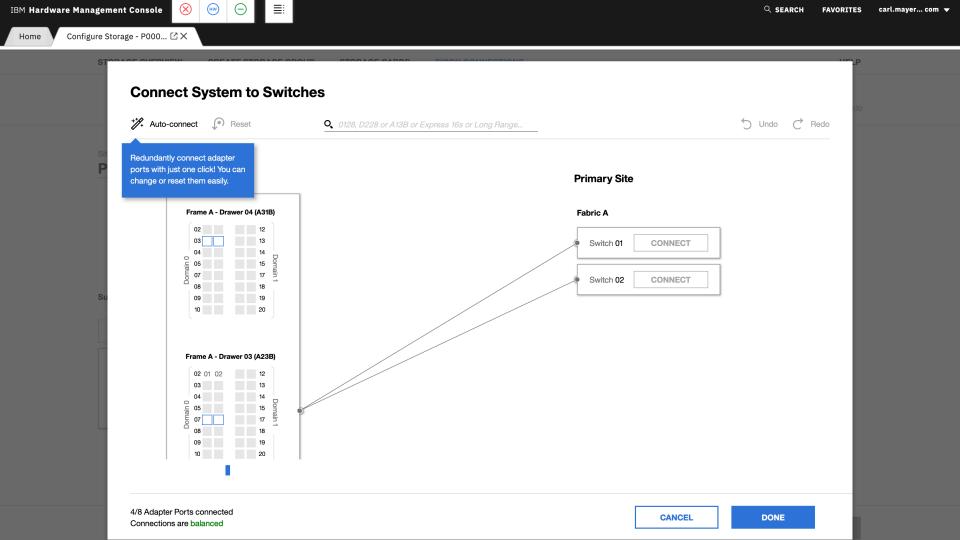


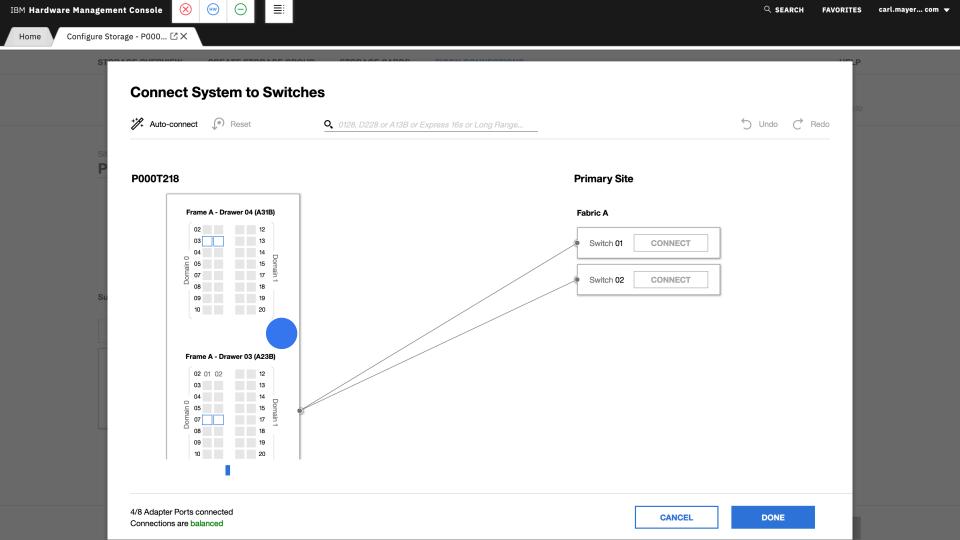


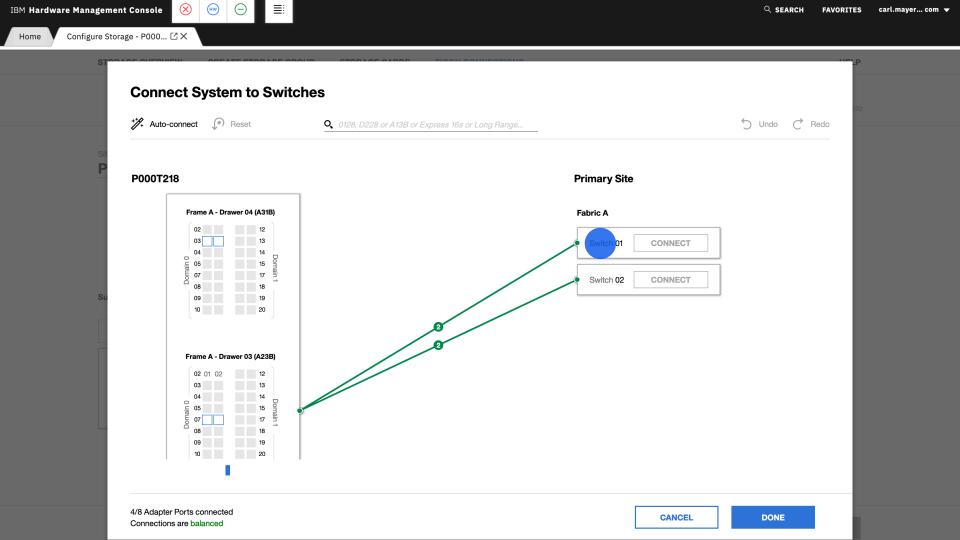


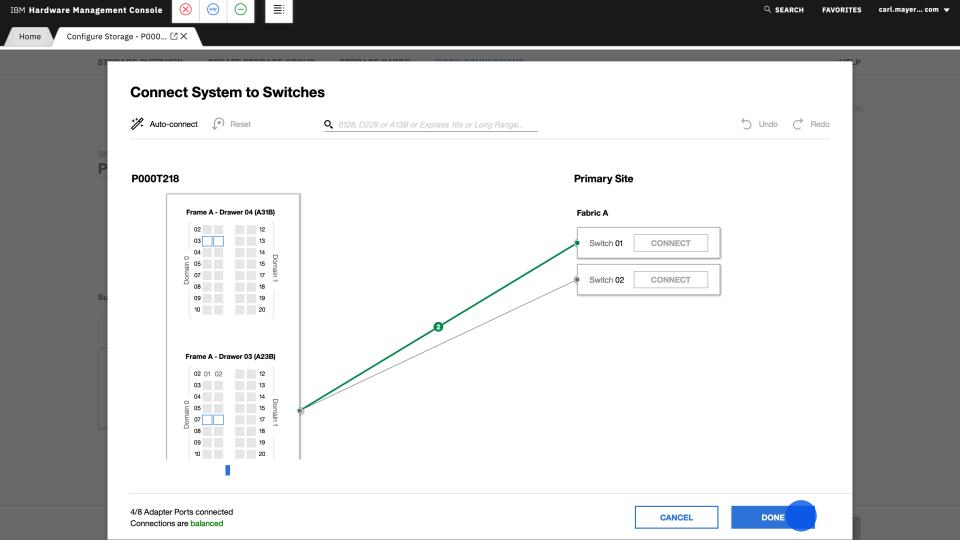


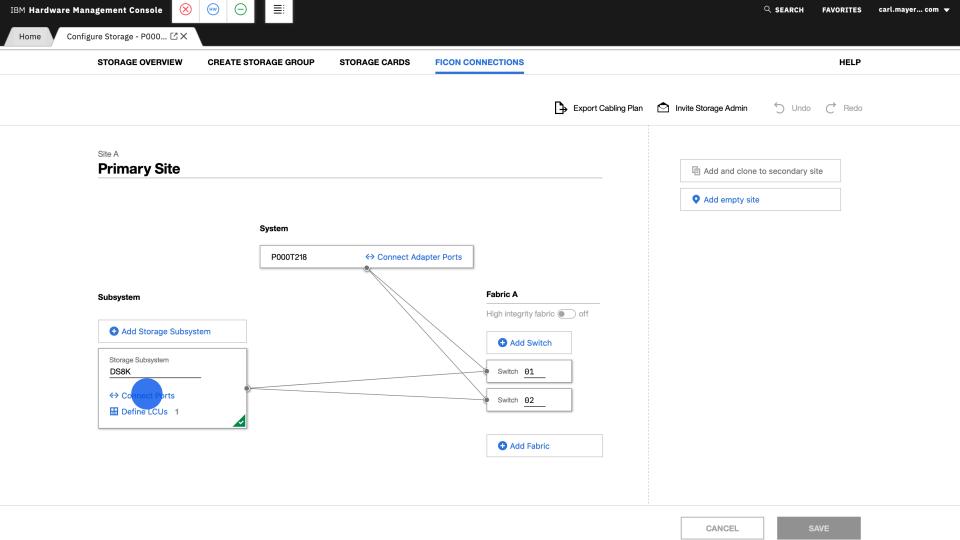


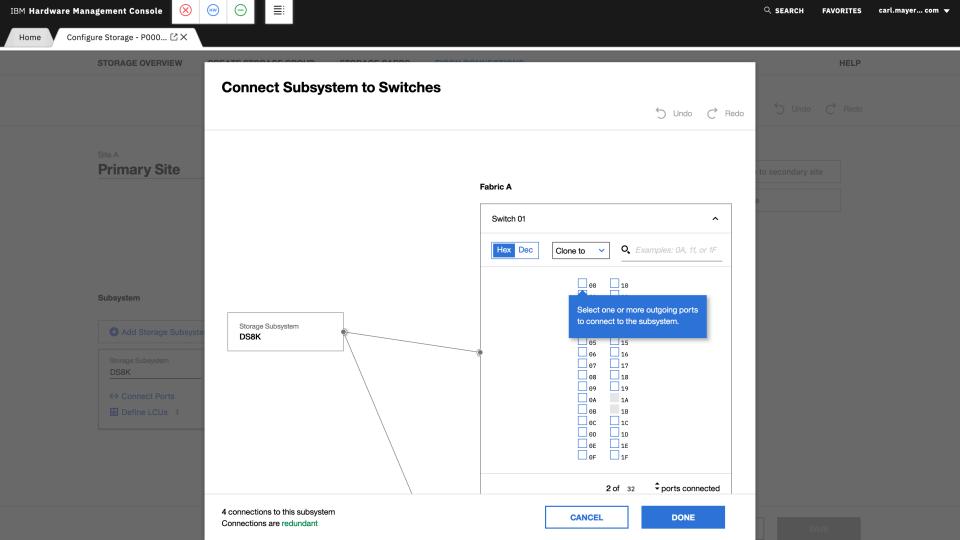


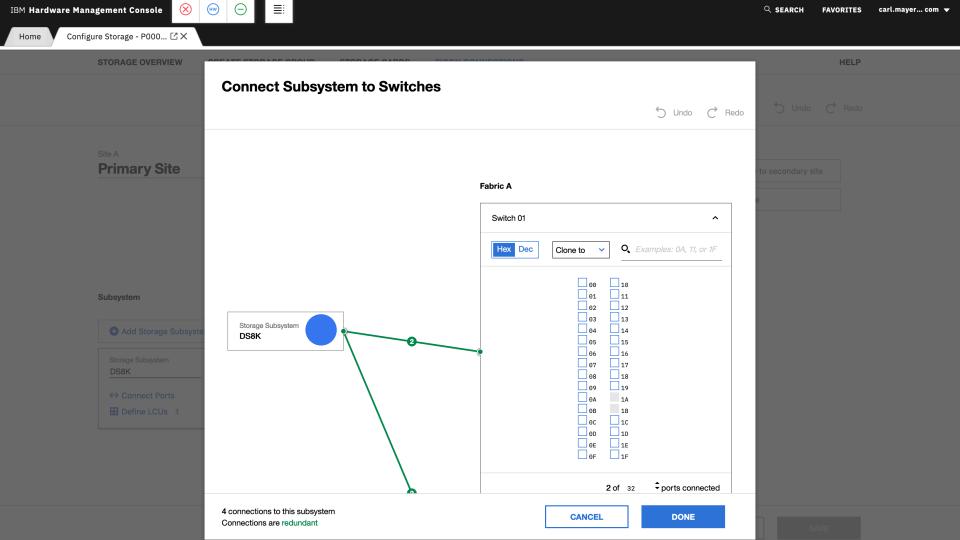


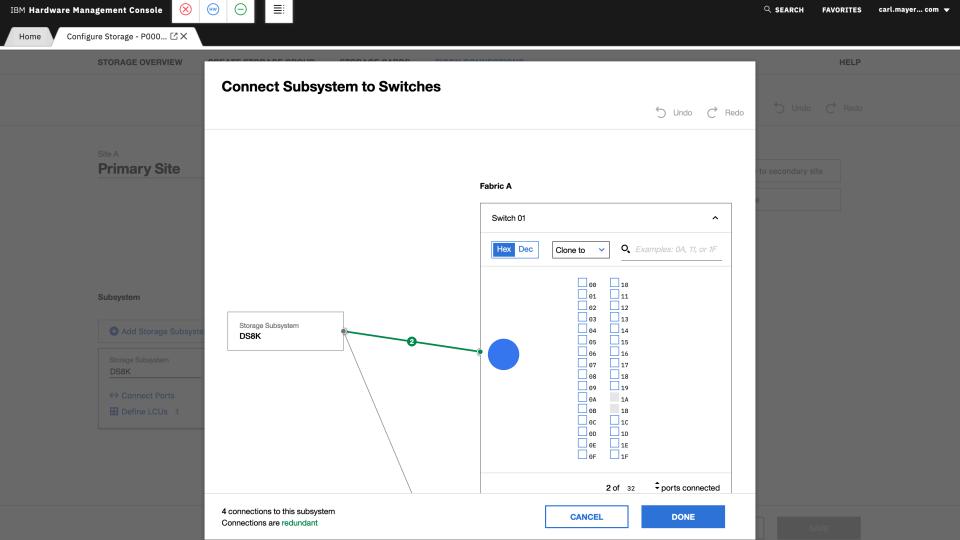


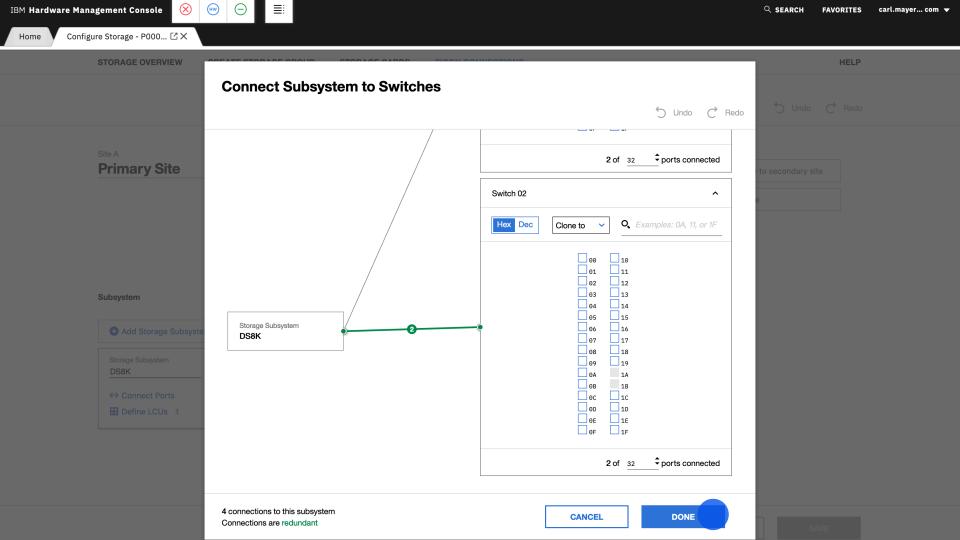


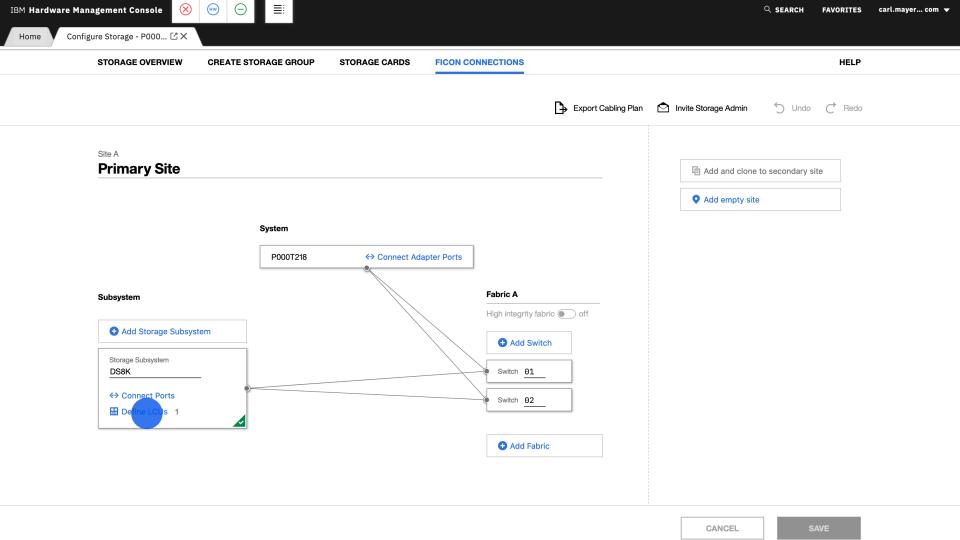


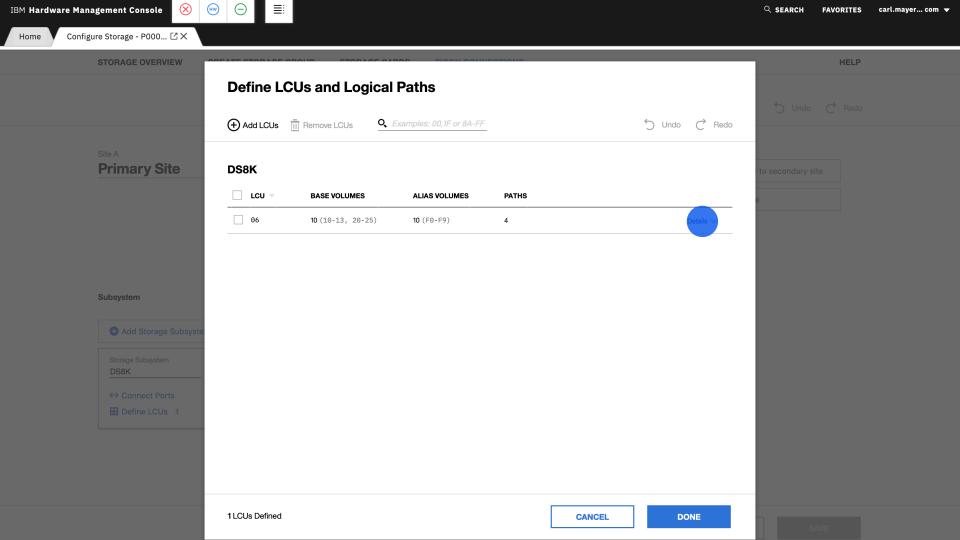


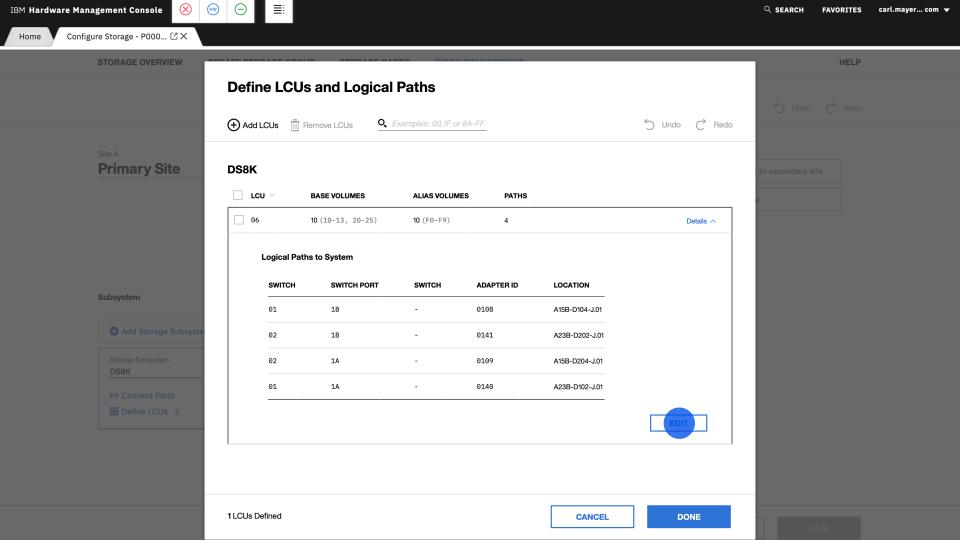


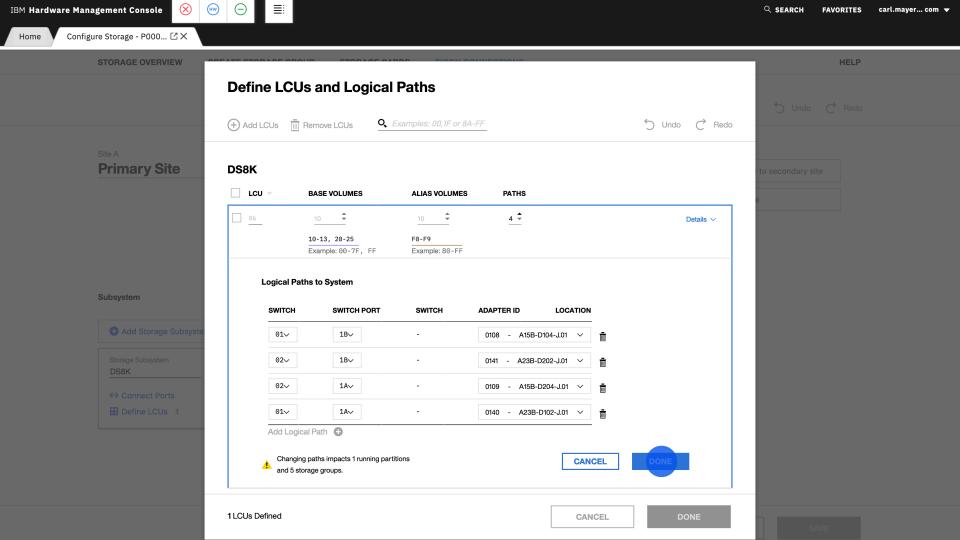


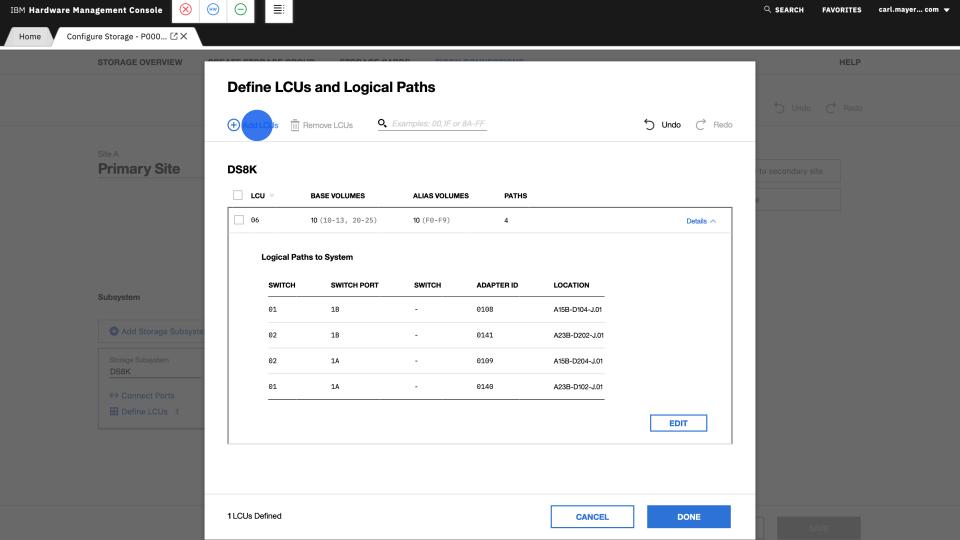


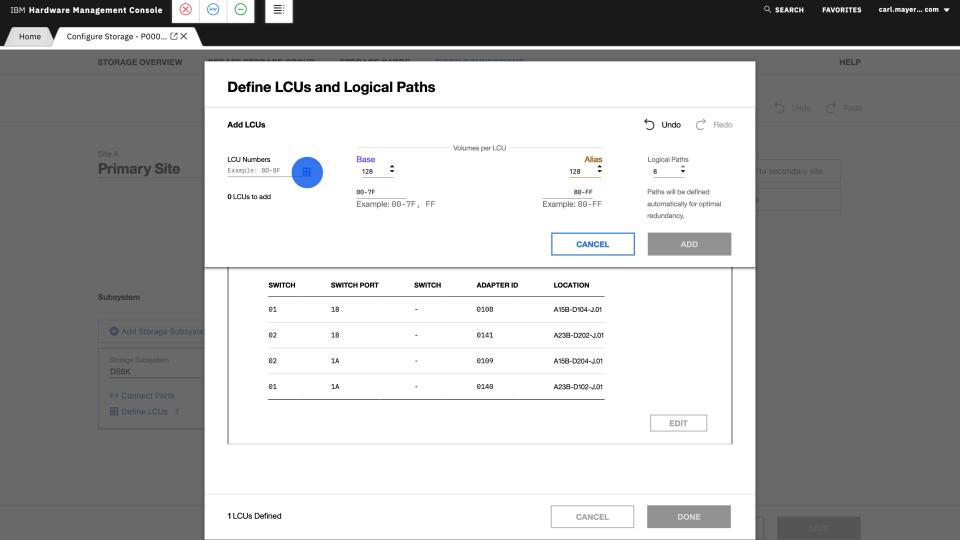


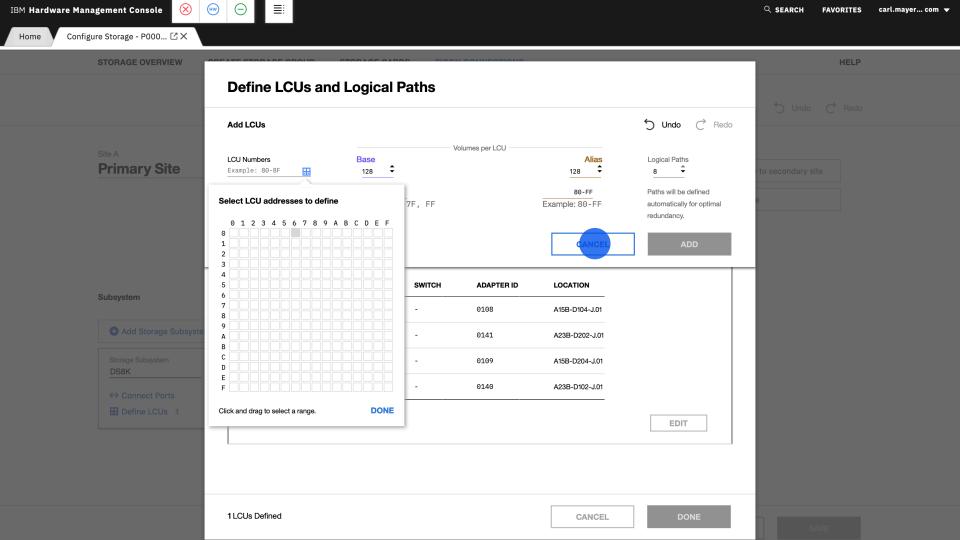


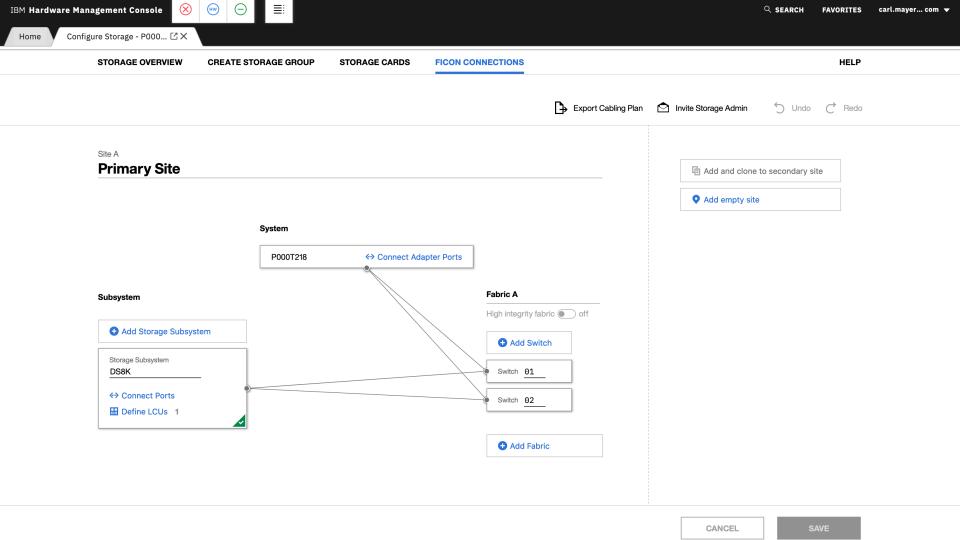


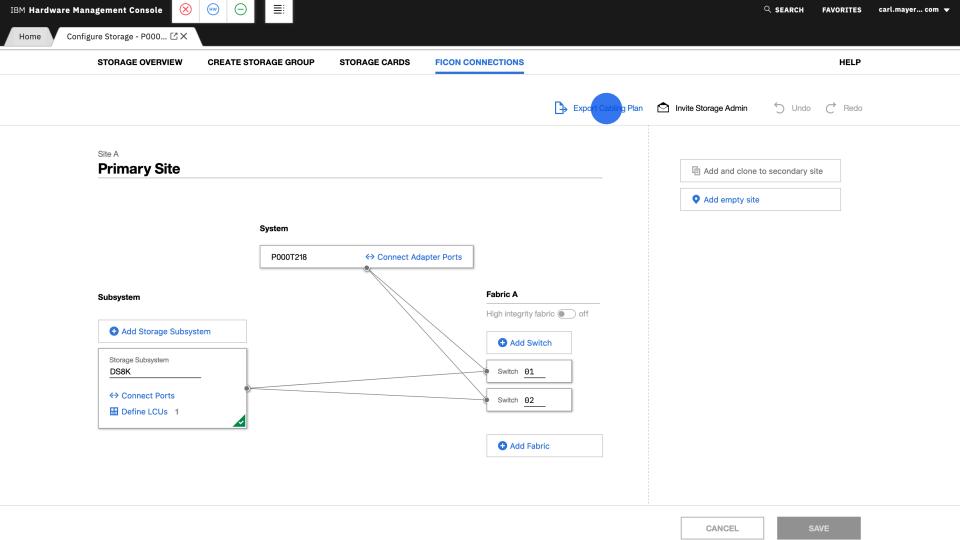








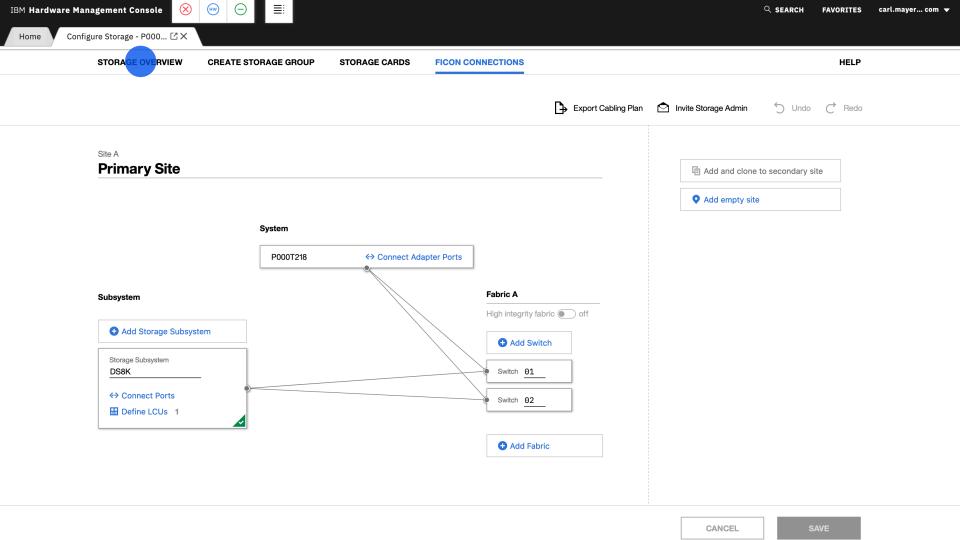






20200221 P000T218

System Name	Adapter ID	Adapter Port Location	Frame	Drawer	Domain	Slot	Port	Card Type	Protocol	Optic Type	Switch ID
P000T218	01A0	A31B-D112-J.01	Α	A31B	1	D112	0	FCP Express32S	FCP	shortrange	
P000T218	01A1	A31B-D212-J.01	Α	A31B	1	D212	1	FCP Express32S	FCP	shortrange	
P000T218	185	A31B-D203-J.01	Α	A31B	0	D203	0	FICON Express16S	FICON	longrange	
P000T218	184	A31B-D103-J.01	Α	A31B	0	D103	1	FICON Express16S	FICON	longrange	
P000T218	188	A31B-D104-J.01	Α	A31B	0	D104	0	FICON Express16SA	UNCONFIGURED	shortrange	
P000T218	189	A31B-D204-J.01	Α	A31B	0	D204	1	FICON Express16SA	UNCONFIGURED	shortrange	
P000T218	150	A23B-D107-J.01	Α	A23B	0	D107	0	FICON Express16S+	FICON	longrange	
P000T218	151	A23B-D207-J.01	Α	A23B	0	D207	1	FICON Express16S+	FICON	longrange	
P000T218	140	A23B-D102-J.01	Α	A23B	0	D102	0	FICON Express16S+	FICON	shortrange	1
P000T218	141	A23B-D202-J.01	Α	A23B	0	D202	1	FICON Express16S+	FICON	shortrange	2
P000T218	178	A23B-D119-J.01	Α	A23B	1	D119	0	FICON Express16S	FCP	shortrange	
P000T218	179	A23B-D219-J.01	Α	A23B	1	D219	1	FICON Express16S	FCP	shortrange	
P000T218	012C	A15B-D115-J.01	Α	A15B	1	D115	0	FCP Express32S	FCP	longrange	
P000T218	012D	A15B-D215-J.01	Α	A15B	1	D215	1	FCP Express32S	FCP	longrange	
P000T218	108	A15B-D104-J.01	Α	A15B	0	D104	0	FICON Express16S	FICON	shortrange	1
P000T218	109	A15B-D204-J.01	Α	A15B	0	D204	1	FICON Express16S	FICON	shortrange	2
P000T218	130	A15B-D117-J.01	Α	A15B	1	D117	0	FICON Express16S	FCP	shortrange	
P000T218	131	A15B-D217-J.01	Α	A15B	1	D217	1	FICON Express16S	FCP	shortrange	



Storage Group Details



FICON CONNECTIONS

STORAGE CARDS

Storage Groups

STORAGE OVERVIEW

CREATE STORAGE GROUP



HELP

NAME ▼		TYPE ▼	PARTITIONS V	SHAREABLE ▼	CAPACITY V	DESCRIPTION V	FULFILLMENT STATE	ACTIONS
FICON for F	RHEL Boot	FICON	2	Shared	7.93 GiB		✓ Complete	
FCP for RH	EL Boot	FCP	1	Dedicated	185 GiB	DO NOT DELETE OR MODIFY! T	Complete	•

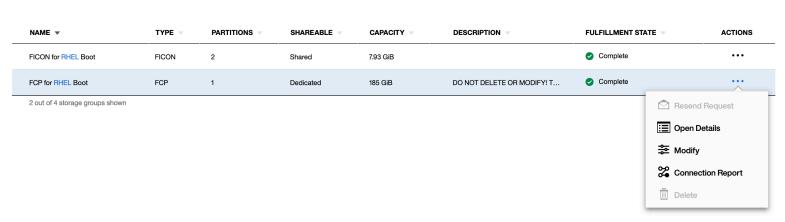
2 out of 4 storage groups shown



RHEL

×



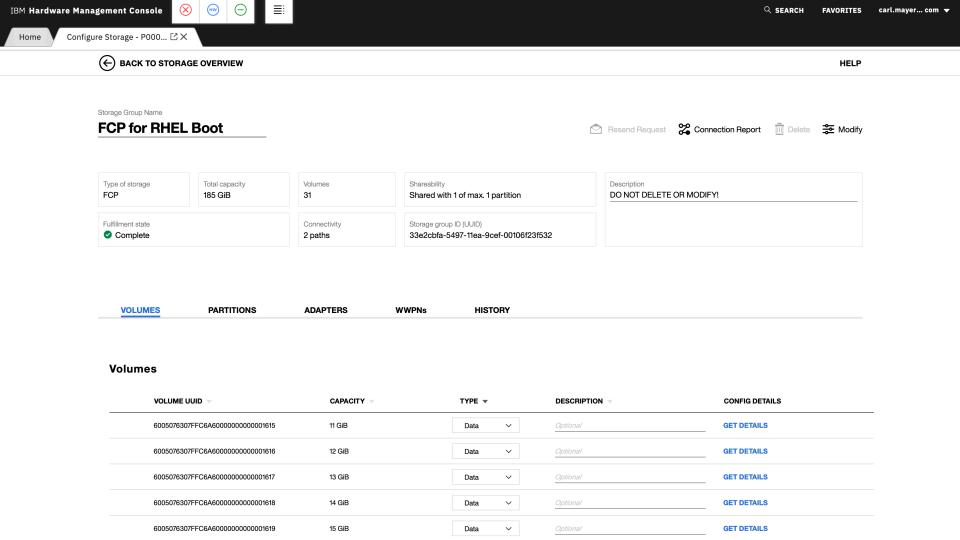








NAME ▼	TYPE ▼	PARTITIONS V	SHAREABLE ▼	CAPACITY =	DESCRIPTION V	FULFILLMENT ST	ATE - ACTIONS
FICON for RHEL Boot	FICON	2	Shared	7.93 GiB		Complete	•••
FCP for RHEL Boot	FCP	1	Dedicated	185 GiB	DO NOT DELETE OR MODIFY! T	Complete	···
2 out of 4 storage groups shown							Resend Request Deen Details Modify
							Connection Report
							Delete





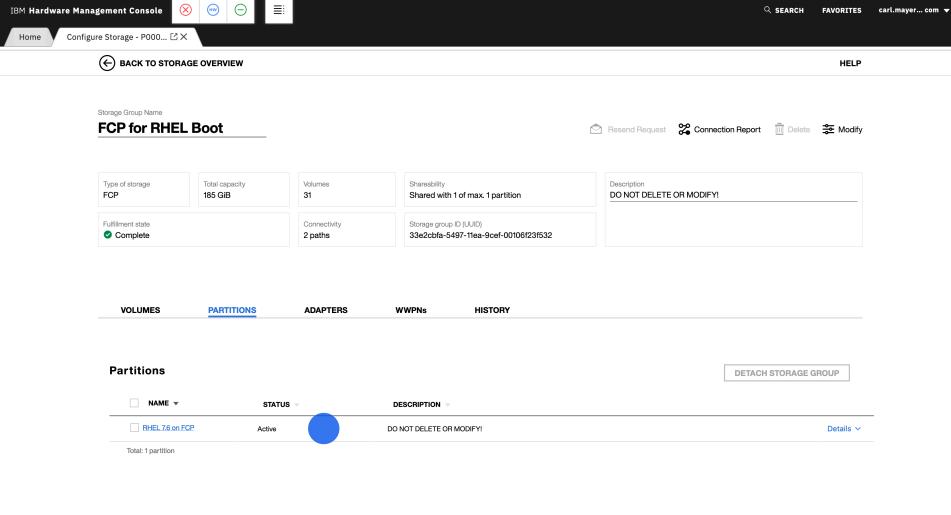
ADAPTERS

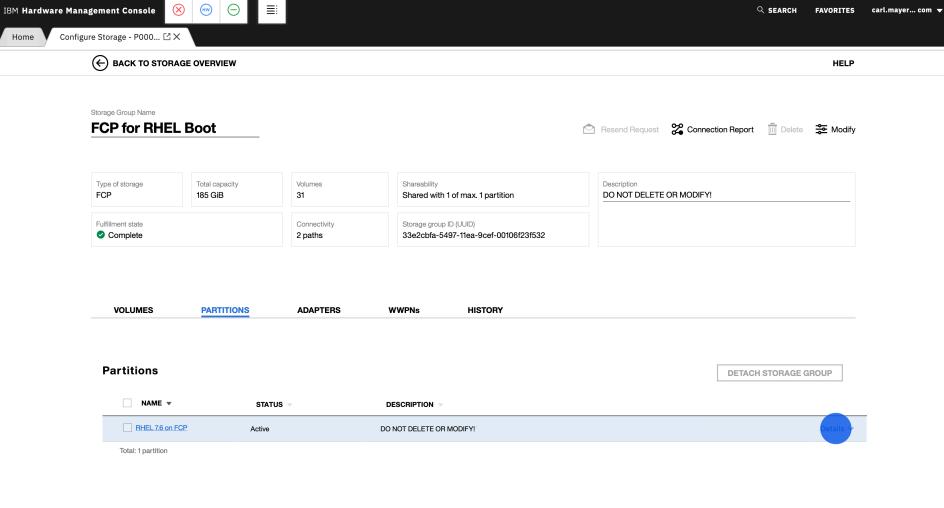
WWPNs

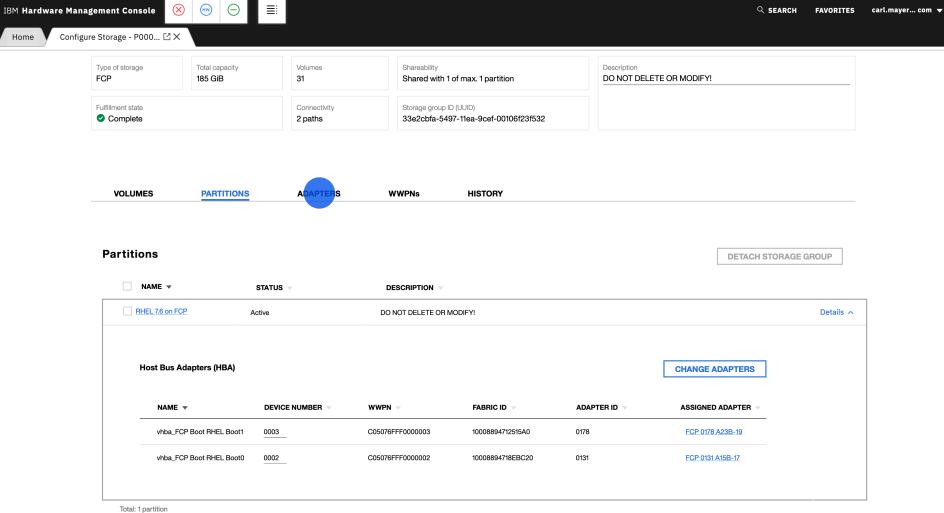
HISTORY

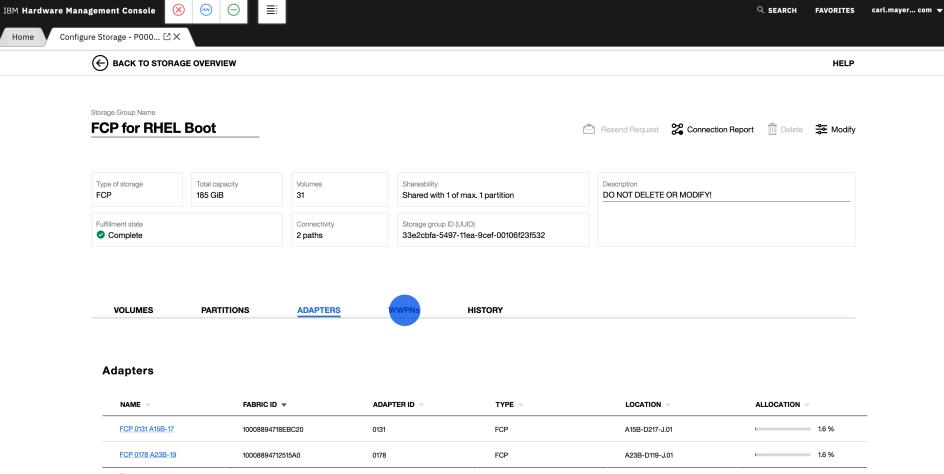
Volumes

	VOLUME UUID	CAPACITY V	TYPE ▼	DESCRIPTION V	CONFIG DETAILS
	6005076307FFC6A6000000000001615	11 GiB	Data ∨	Optional	GET DETAILS
	6005076307FFC6A6000000000001616	12 GiB	Data ∨	Optional	GET DETAILS
	6005076307FFC6A6000000000001617	13 GiB	Data ∨	Optional	GET DETAILS
	6005076307FFC6A6000000000001618	14 GiB	Data ∨	Optional	GET DETAILS
	6005076307FFC6A6000000000001619	15 GiB	Data ∨	Optional	GET DETAILS
	6005076307FFC6A600000000000161A	16 GiB	Data ∨	Optional	GET DETAILS
	6005076307FFC6A600000000000161B	17 GiB	Data ∨	Optional	GET DETAILS
	6005076307FFC6A600000000000161C	18 GiB	Data ∨	Optional	GET DETAILS
	6005076307FFC6A600000000000161D	19 GiB	Data ∨	Optional	GET DETAILS
	6005076307FFC6A600000000000161E	20 GiB	Data ∨	Optional	GET DETAILS
20 >	Various	1 GiB	Data ∨	Optional	GET DETAILS
	6005076307FFC6A6000000000001614	10 GiB	Boot 🗸	To attach with Partition RHEL 7.6 on FCP, DONT DE	GET DETAILS

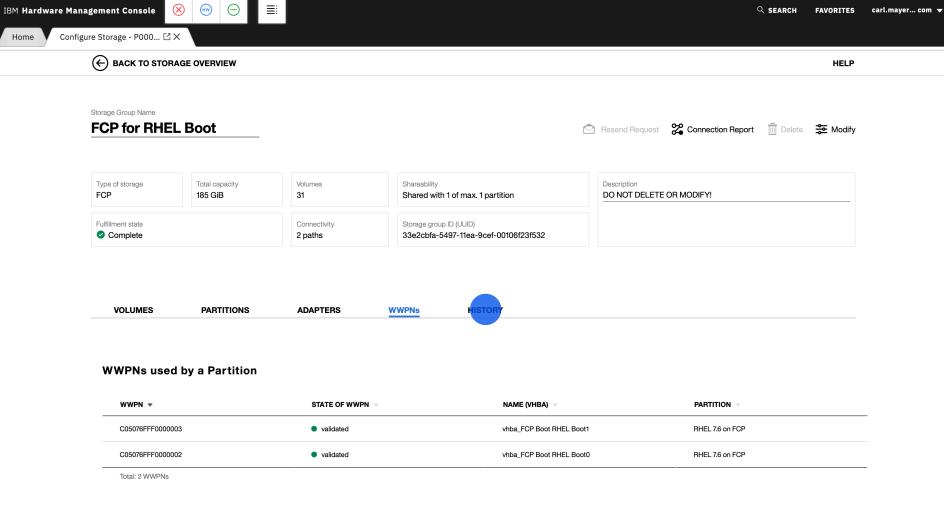


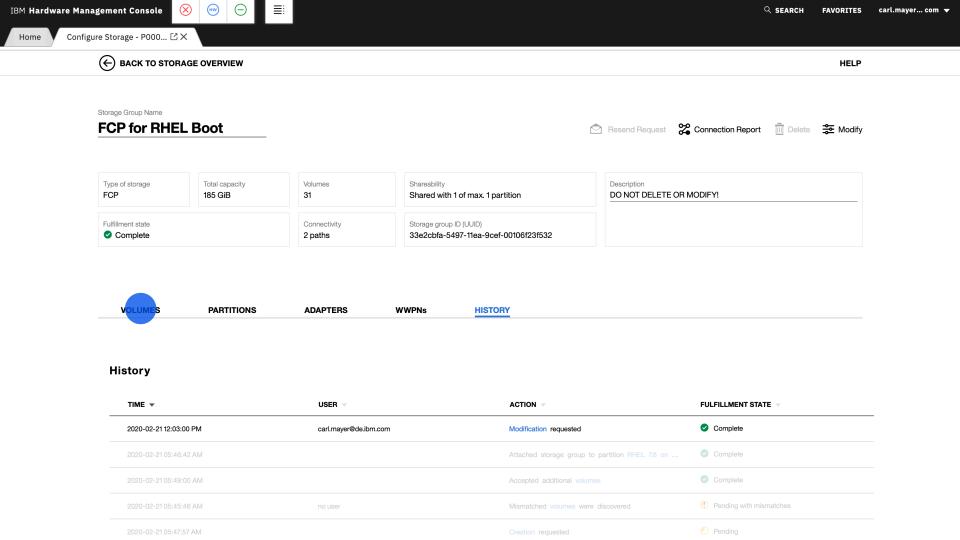


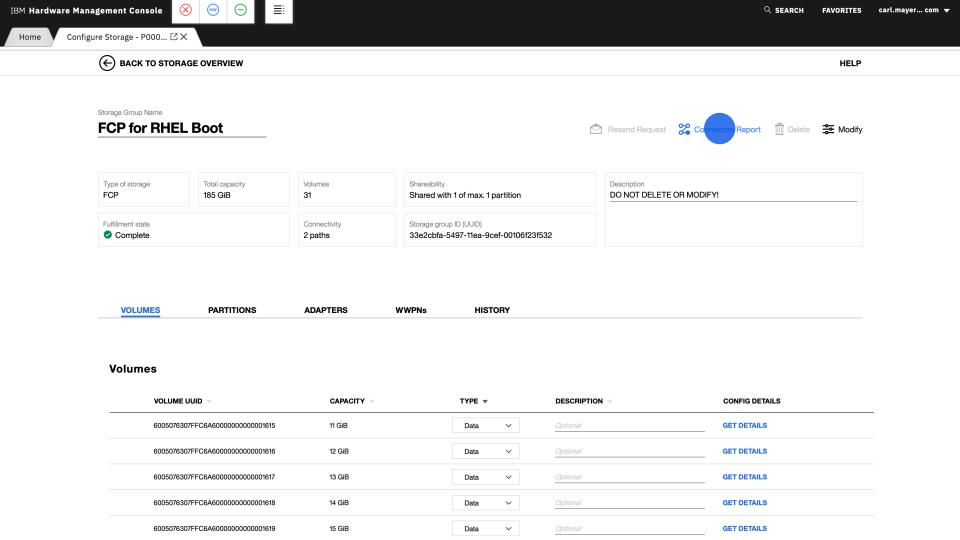


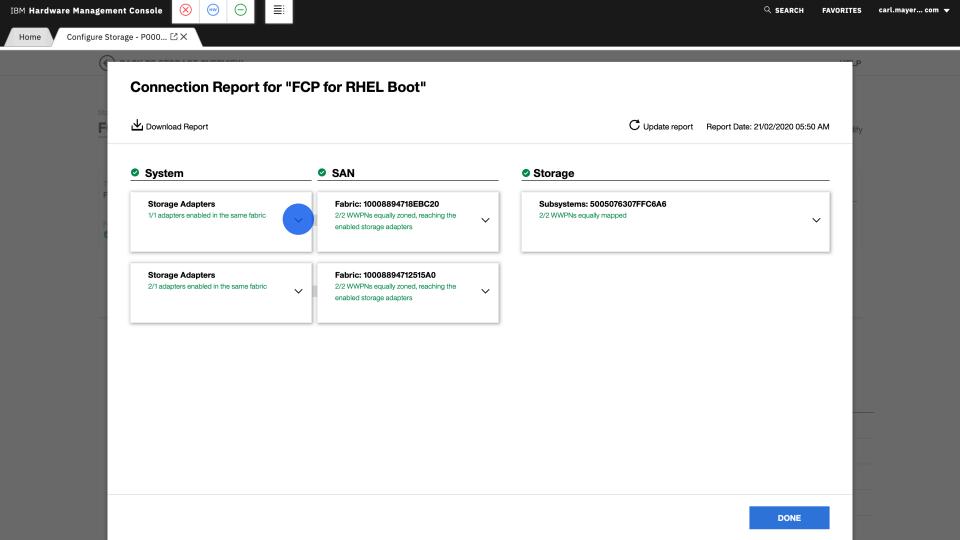


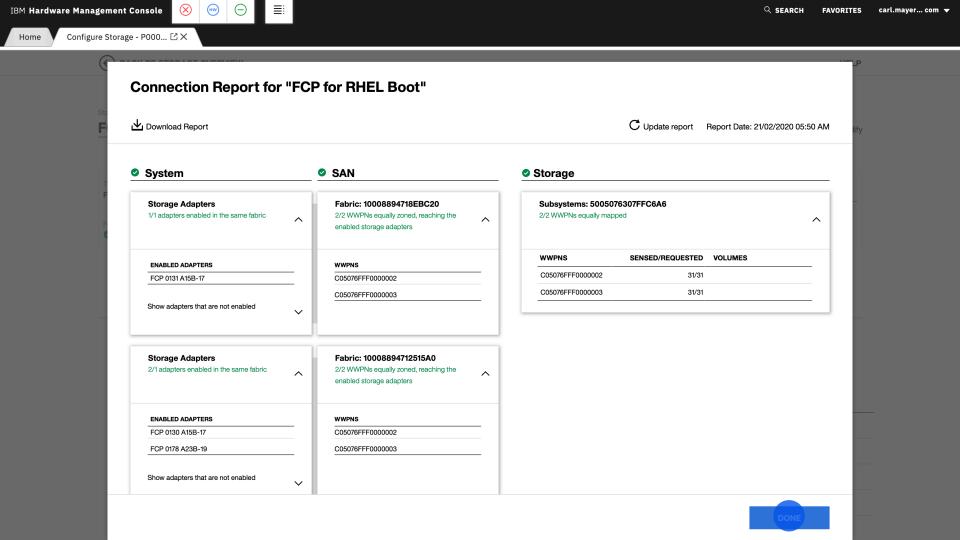
Total: 2 adapters

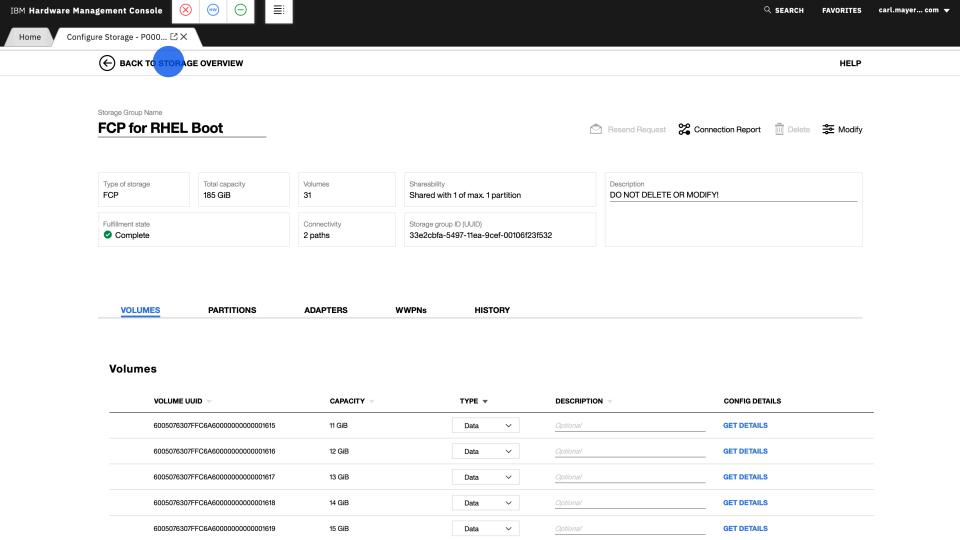












Essential Experiences

INITIAL SET-UP

Get Started

Configure Storage Cards

Configure FICON

Export Cabling Details

PRE-PROVISIONING

Regular Use

Storage Overview

Request Storage

Use Templates

STORAGE ATTACHMENT

Regular Use and Get Help

Create New Partition

Connection Report

IBM Z | February 24, 2020 | © 2020 IBM Corporation

Create Storage Group



Storage Groups



NAME ▼	TYPE 🔻	PARTITIONS V	SHAREABLE =	CAPACITY ~	DESCRIPTION V	FULFILLMENT STATE	ACTIONS
FICON for RHEL Boot	FICON	2	Shared	7.93 GiB		Complete	•••
FCP for RHEL Boot	FCP	1	Dedicated	185 GiB	DO NOT DELETE OR MODIFY! T	Complete	•••

2 out of 4 storage groups shown



Create Storage Group

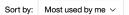
Select one of the following items to choose a storage group template or create a storage group without a template.

Without Template



Templates





Create Template



Create Storage Group

Select one of the following items to choose a storage group template or create a storage group without a template.

Without Template

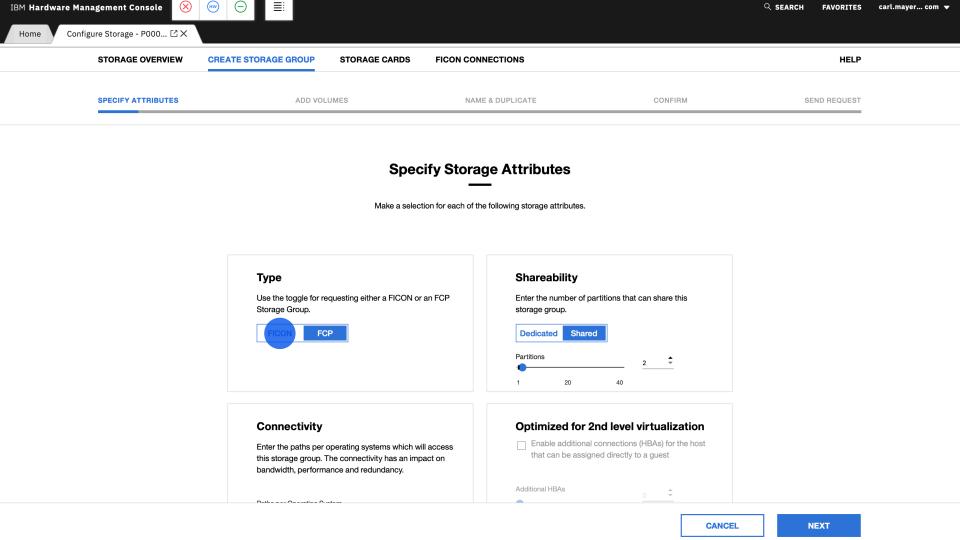


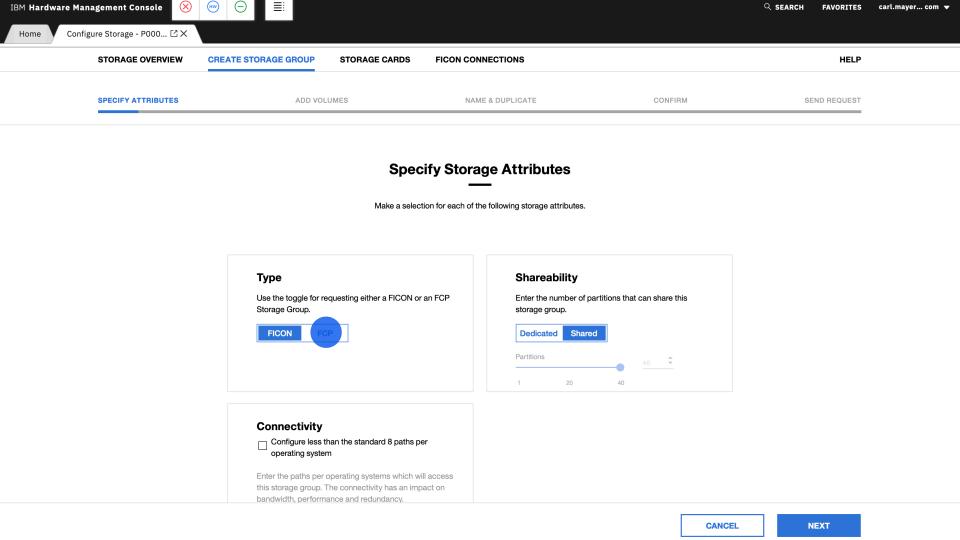
Templates

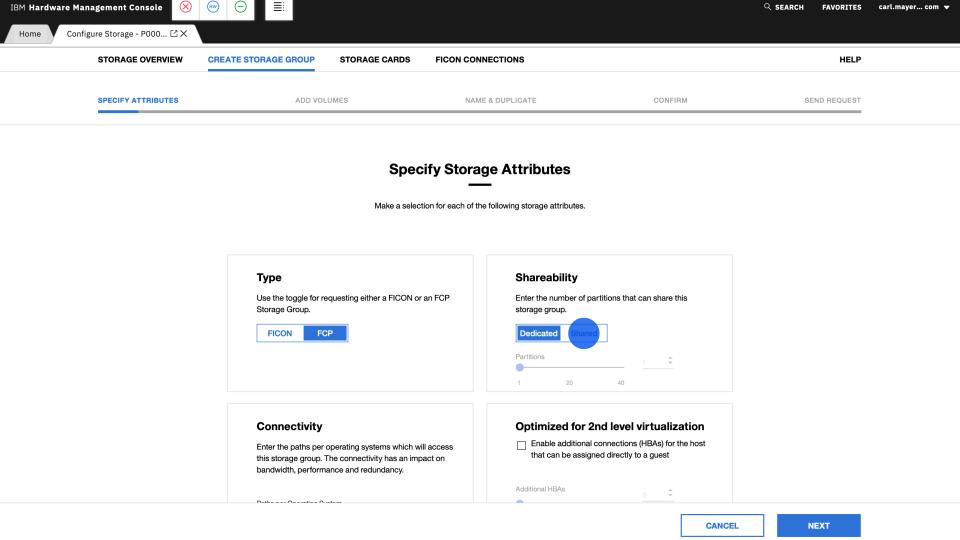


Sort by: Most used by me V









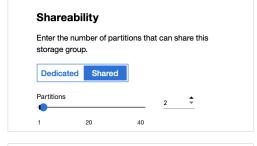
Configure Storage - P000... ☑ 🗙

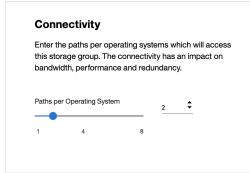
Home

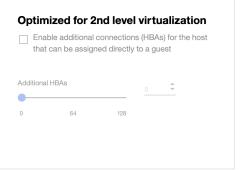
Specify Storage Attributes

Make a selection for each of the following storage attributes.









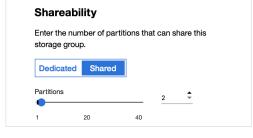
Configure Storage - P000... ☐ 🗙

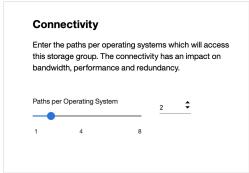
Home

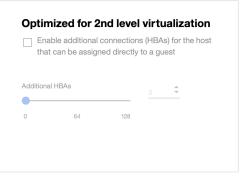
Specify Storage Attributes

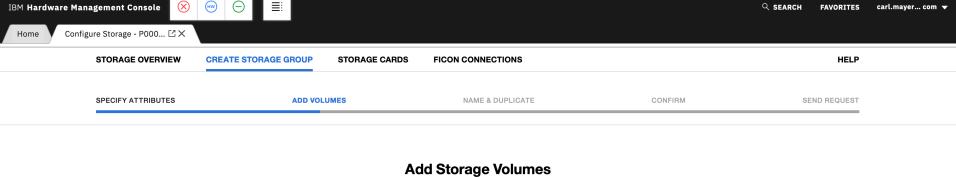
Make a selection for each of the following storage attributes.



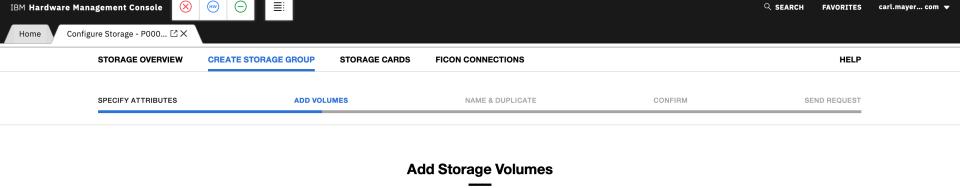




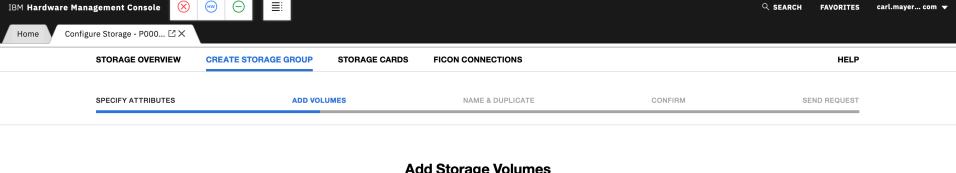


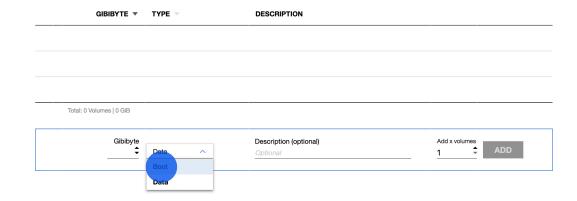


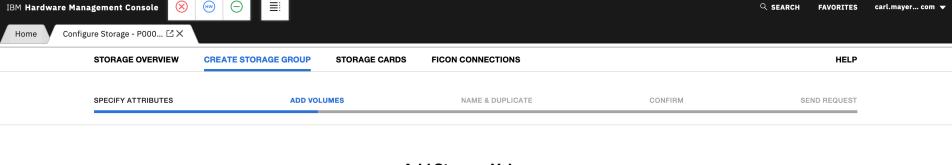
GIBIBYTE ▼	TYPE ▼	DESCRIPTION	
Total: 0 Volumes 0 GiB			
Gibibyte	Data	Description (optional) Optional	Add x volumes 1 ADD



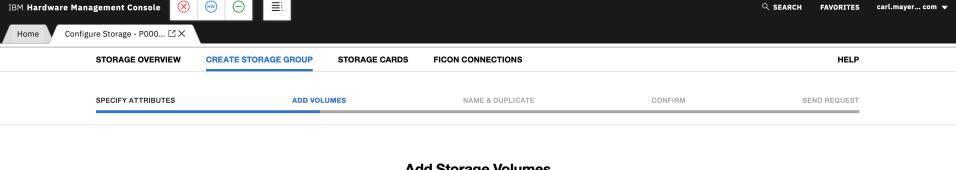




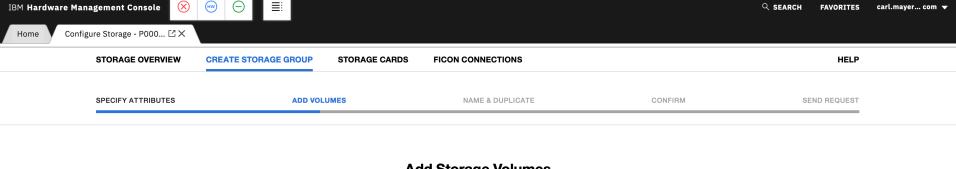




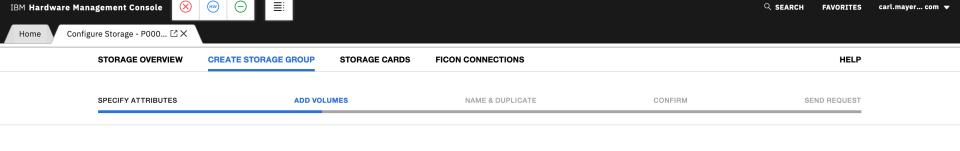
GIBIBYTE ▼	TYPE V	DESCRIPTION	
Total: 0 Volumes 0 GiB			
Total. 0 Volumes 0 dilb			
Gibibyte	Boot	Description (optional) Optional	Add x volumes ADD



GIBIBYTE ▼	TYPE V	DESCRIPTION	
Total: 0 Volumes 0 GiB			
Gibibyte	Boot ~	Description (optional) Optional	Add x volumes



GIBIBYTE ▼	TYPE V	DESCRIPTION	
Total: 0 Volumes 0 GiB			
Gibibyte		Description (optional)	Add x volumes
11 ♀	Boot ~	Optional	1 \$\display ADD



GIBIBYTE ▼	TYPE ▼	DESCRIPTION	
Total: 0 Volumes 0 GiB			
Gibibyte 11 →	Boot	Description (optional) Optional	Add x volumes















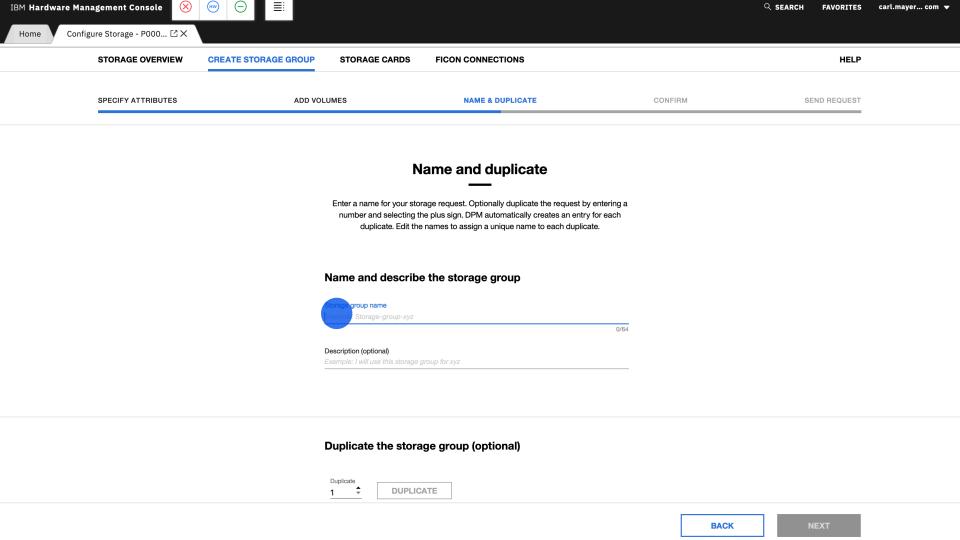


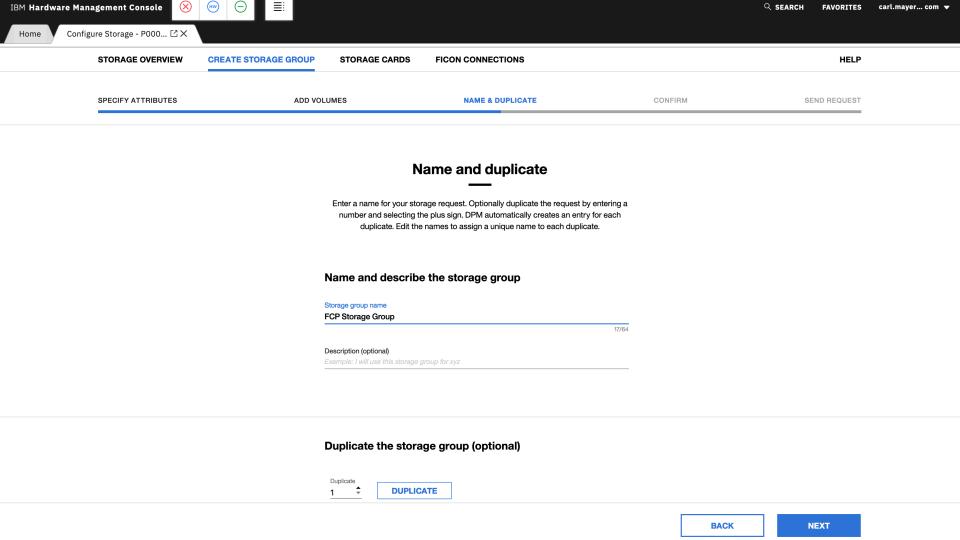


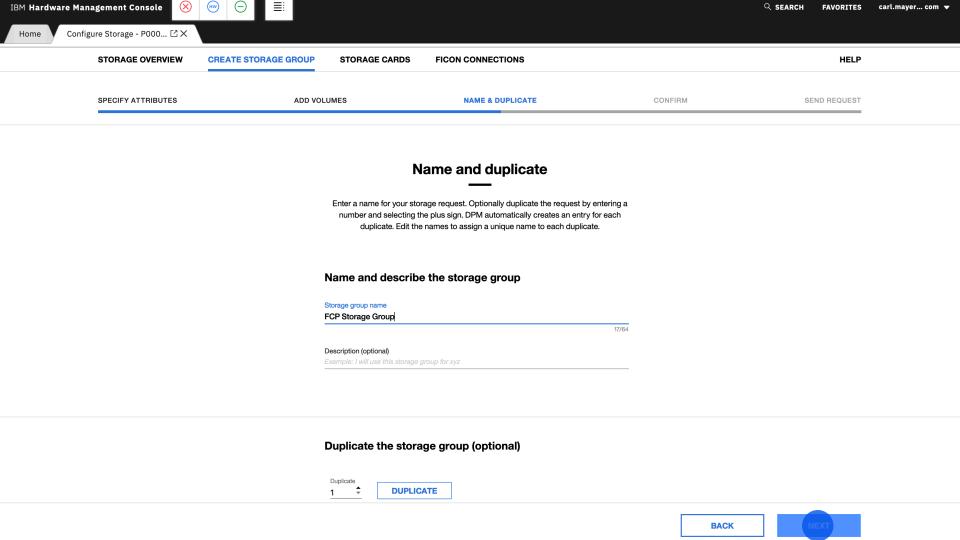


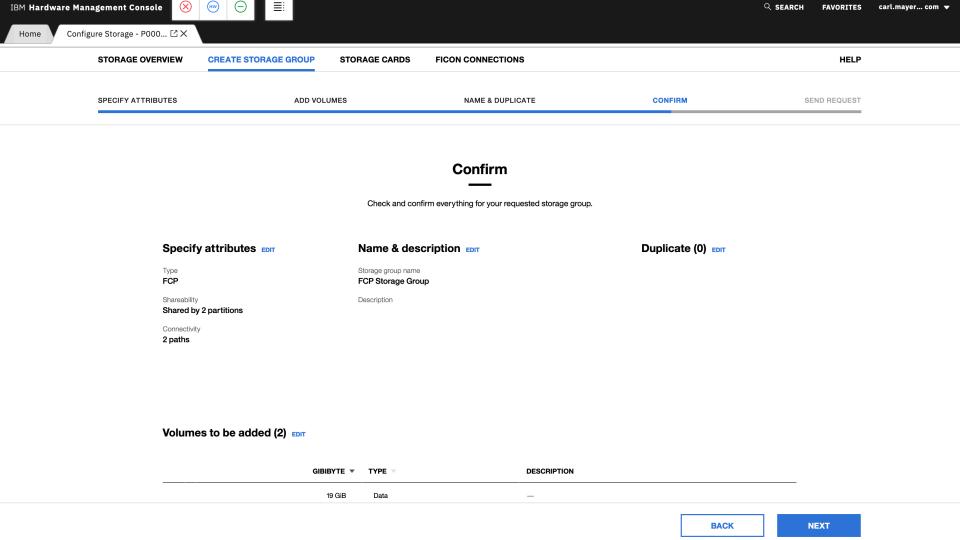












carl.mayer... com ▼

Home

Configure Storage - P000... ☑ 🗙

Confirm

Check and confirm everything for your requested storage group.

Type FCP Shareability Shared by 2 partitions

Specify attributes EDIT

Connectivity 2 paths

Name & description EDIT

Storage group name FCP Storage Group

Description

Volumes to be added (2) EDIT

GIBIBYTE ▼ TYPE ▼ DESCRIPTION 19 GiB Data 11 GiB Boot

Total: 2 Volumes | 30 GiB

Duplicate (0) EDIT

Home

FAVORITES

Confirm

Check and confirm everything for your requested storage group.

Specify attributes EDIT

Type FCP

Shareability

Shared by 2 partitions

Connectivity 2 paths

Name & description EDIT

Storage group name FCP Storage Group

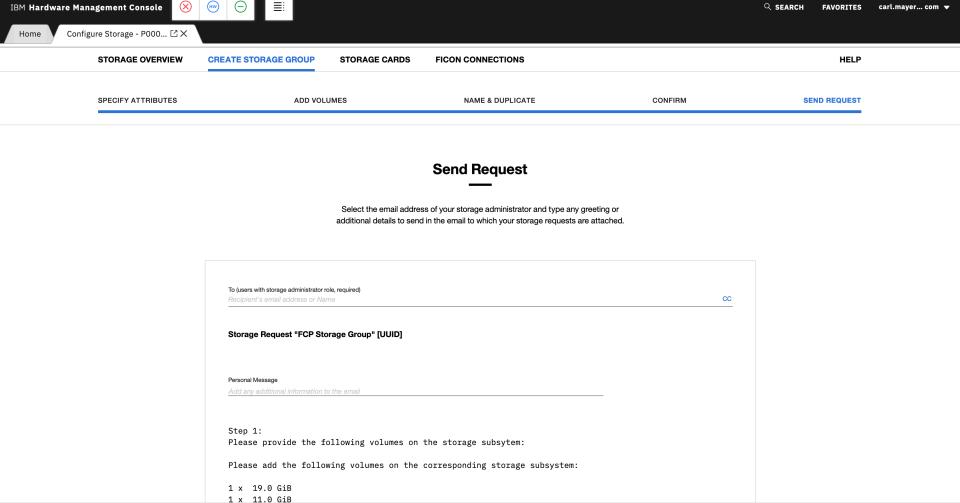
Description

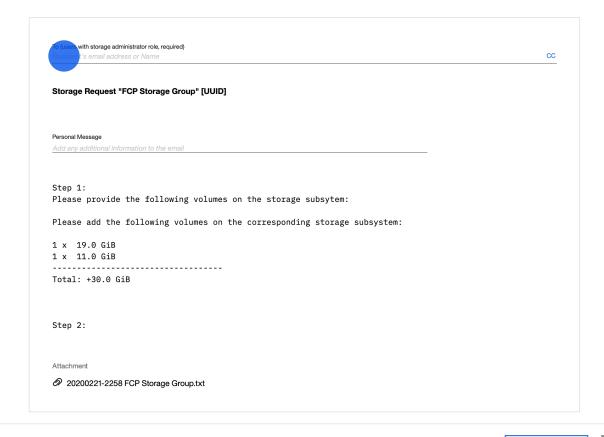
Volumes to be added (2) EDIT

GIBIBYTE ▼ TYPE ▼ DESCRIPTION 19 GiB Data 11 GiB Boot

Total: 2 Volumes | 30 GiB

Duplicate (0) EDIT





Configure Storage - P000... ☐ X

STORAGEADMIN X	CC
Storage Request "FCP Storage Group" [UUID]	
Personal Message	
Add any additional information to the email	
Stop 1.	
Step 1: Please provide the following volumes on the storage subsytem:	
·	
Step 1: Please provide the following volumes on the storage subsytem: Please add the following volumes on the corresponding storage subsystem:	
Please provide the following volumes on the storage subsytem:	
Please provide the following volumes on the storage subsytem: Please add the following volumes on the corresponding storage subsystem:	
Please provide the following volumes on the storage subsytem: Please add the following volumes on the corresponding storage subsystem: 1 x 19.0 GiB 1 x 11.0 GiB	
Please provide the following volumes on the storage subsytem: Please add the following volumes on the corresponding storage subsystem: 1 x 19.0 GiB 1 x 11.0 GiB	
Please provide the following volumes on the storage subsytem: Please add the following volumes on the corresponding storage subsystem: 1 x 19.0 GiB 1 x 11.0 GiB	
Please provide the following volumes on the storage subsytem: Please add the following volumes on the corresponding storage subsystem: 1 x 19.0 GiB 1 x 11.0 GiB Total: +30.0 GiB	
Please provide the following volumes on the storage subsytem: Please add the following volumes on the corresponding storage subsystem: 1 x 19.0 GiB 1 x 11.0 GiB	
Please provide the following volumes on the storage subsytem: Please add the following volumes on the corresponding storage subsystem: 1 x 19.0 GiB 1 x 11.0 GiB Total: +30.0 GiB	
Please provide the following volumes on the storage subsytem: Please add the following volumes on the corresponding storage subsystem: 1 x 19.0 GiB 1 x 11.0 GiB Total: +30.0 GiB	

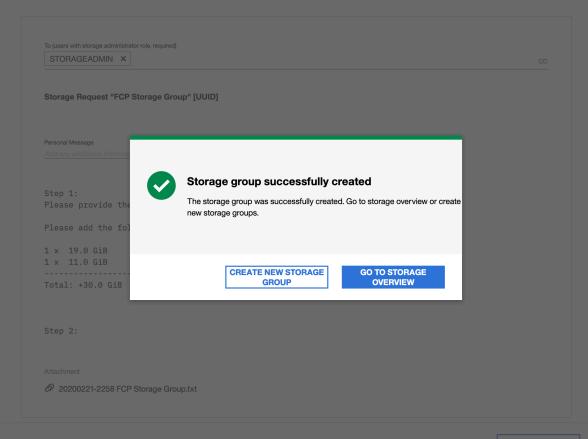
Configure Storage - P000... ☐ 🗙 Home

STORAGEADMIN X	cc
Storage Request "FCP Storage Group" [UUID]	
Piracel Harres	
Personal Message Add any additional information to the email	
Step 1:	
·	
Please provide the following volumes on the storage subsytem:	
Please provide the following volumes on the storage subsytem:	
Please provide the following volumes on the storage subsytem: Please add the following volumes on the corresponding storage subsystem: 1 x 19.0 GiB	
Please provide the following volumes on the storage subsytem: Please add the following volumes on the corresponding storage subsystem: 1 x 19.0 GiB 1 x 11.0 GiB	
Please provide the following volumes on the storage subsytem: Please add the following volumes on the corresponding storage subsystem: 1 x 19.0 GiB	
Please provide the following volumes on the storage subsytem: Please add the following volumes on the corresponding storage subsystem: 1 x 19.0 GiB 1 x 11.0 GiB	
Please provide the following volumes on the storage subsytem: Please add the following volumes on the corresponding storage subsystem: 1 x 19.0 GiB 1 x 11.0 GiB	
Please provide the following volumes on the storage subsystem: Please add the following volumes on the corresponding storage subsystem: 1 x 19.0 GiB 1 x 11.0 GiB Total: +30.0 GiB	
Please provide the following volumes on the storage subsytem: Please add the following volumes on the corresponding storage subsystem: 1 x 19.0 GiB 1 x 11.0 GiB	
Please provide the following volumes on the storage subsystem: Please add the following volumes on the corresponding storage subsystem: 1 x 19.0 GiB 1 x 11.0 GiB Total: +30.0 GiB	

Home

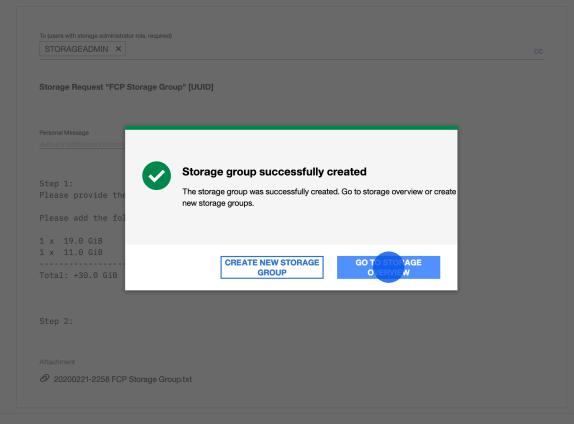
Configure Storage - P000... ☑ 🗙

STORAGEADMIN X	C
Storage Request "FCP Storage Group" [UUID]	
Storage nequest 1 or storage droup [ooib]	
Personal Message	
Add any additional information to the email	
Step 1:	
Please provide the following volumes on the storage subsytem:	
Please add the following volumes on the cor.espon ing storage subsystem:	
1 × 19.0 GiB	
1 × 19.0 GiB	
1 x 19.0 GiB 1 x 11.0 GiB	
1 x 19.0 GiB 1 x 11.0 GiB 	
1 x 19.0 GiB 1 x 11.0 GiB	
1 x 19.0 GiB 1 x 11.0 GiB 	
1 x 19.0 GiB 1 x 11.0 GiB 	



Configure Storage - P000... ☑ 🗙

Home





Storage Groups

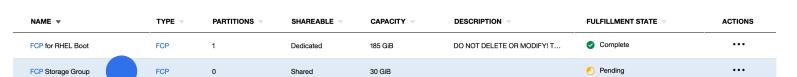


NAME ▼	TYPE 🔻	PARTITIONS V	SHAREABLE V	CAPACITY V	DESCRIPTION V	FULFILLMENT STATE	ACTIONS
FCP for RHEL Boot	FCP	1	Dedicated	185 GiB	DO NOT DELETE OR MODIFY! T	Complete	•••
FCP Storage Group	FCP	0	Shared	30 GiB		Pending	•••

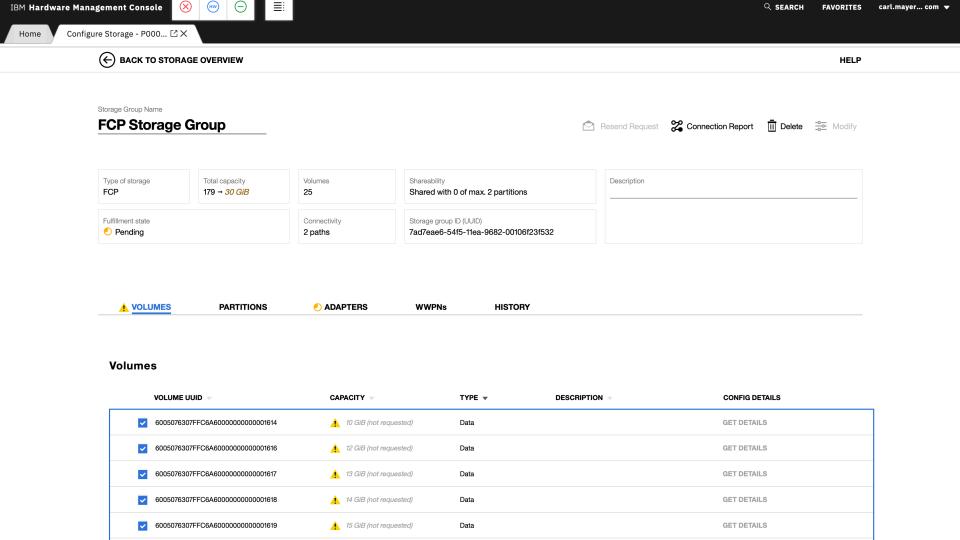
2 out of 5 storage groups shown



Storage Groups



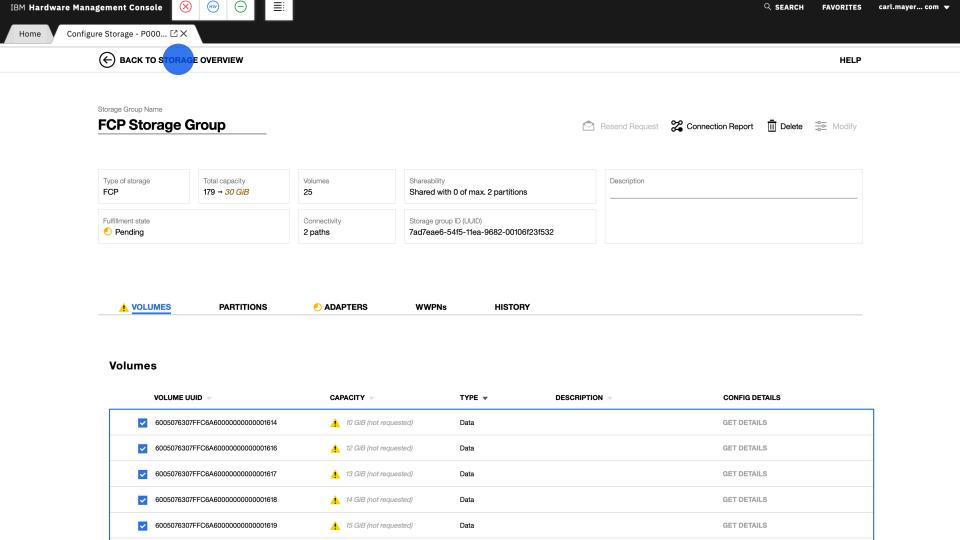
2 out of 5 storage groups shown



Home

Volumes

	VOLUME UUID	CAPACITY W	TYPE ▼	DESCRIPTION V	CONFIG DETAILS		
14 >	Various	1 GiB (not requested)	Data		GET DETAILS		
_	6005076307FFC6A6000000000001614	10 GiB (not requested)	Data		GET DETAILS		
_	6005076307FFC6A6000000000001616	12 GiB (not requested)	Data		GET DETAILS		
_	6005076307FFC6A6000000000001617	13 GiB (not requested)	Data		GET DETAILS		
_	6005076307FFC6A6000000000001618	14 GiB (not requested)	Data		GET DETAILS		
_	6005076307FFC6A6000000000001619	15 GiB (not requested)	Data		GET DETAILS		
_	6005076307FFC6A600000000000161A	16 GiB (not requested)	Data		GET DETAILS		
_	6005076307FFC6A600000000000161B	17 GiB (not requested)	Data		GET DETAILS		
~	6005076307FFC6A6000000000000161C	18 GiB (not requested)	Data	GET DETAILS			
_	6005076307FFC6A600000000000161E	20 GiB (not requested)	Data	GET DETAILS			
1 23	volumes were sensed for this storage group but di	id not match the original request.		REQUEST D	ELETION KEEP IN GROUP		
	6005076307FFC6A600000000000161D	19 GiB	Data	_	GET DETAILS		
	6005076307FFC6A6000000000001615	11 GiB	Boot	_	GET DETAILS		
Total:	25 volumes		,				





FICON CONNECTIONS

STORAGE CARDS



STORAGE OVERVIEW

CREATE STORAGE GROUP



HELP

NAME *	TYPE w	PARTITIONS V	SHAREABLE V	CAPACITY V	DESCRIPTION V	FULFILLMENT STATE	ACTIONS
FCP for RHEL Boot	FCP	1	Dedicated	185 GiB	DO NOT DELETE OR MODIFY! T	Complete	•••
FCP Storage Group	FCP	0	Shared	30 GiB		Pending	•••

2 out of 5 storage groups shown

Essential Experiences

INITIAL SET-UP

Get Started

Configure Storage Cards

Configure FICON

Export Cabling Details

PRE-PROVISIONING

Regular Use

Storage Overview

Request Storage

Use Templates

STORAGE ATTACHMENT

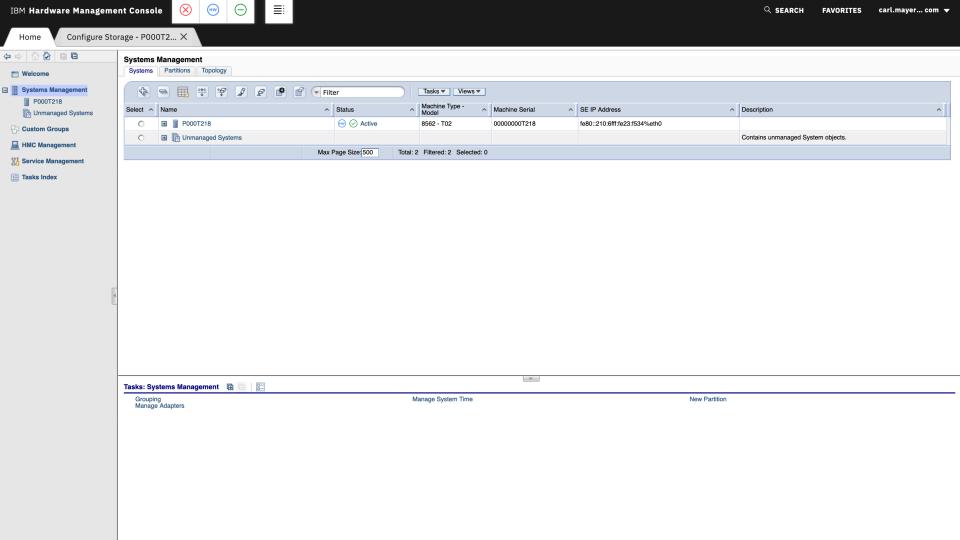
Regular Use and Get Help

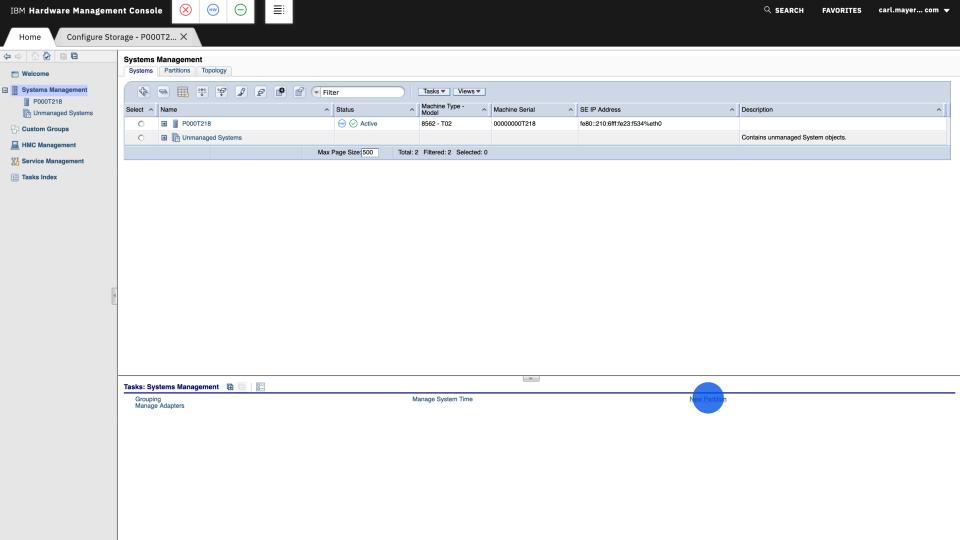
Create New Partition

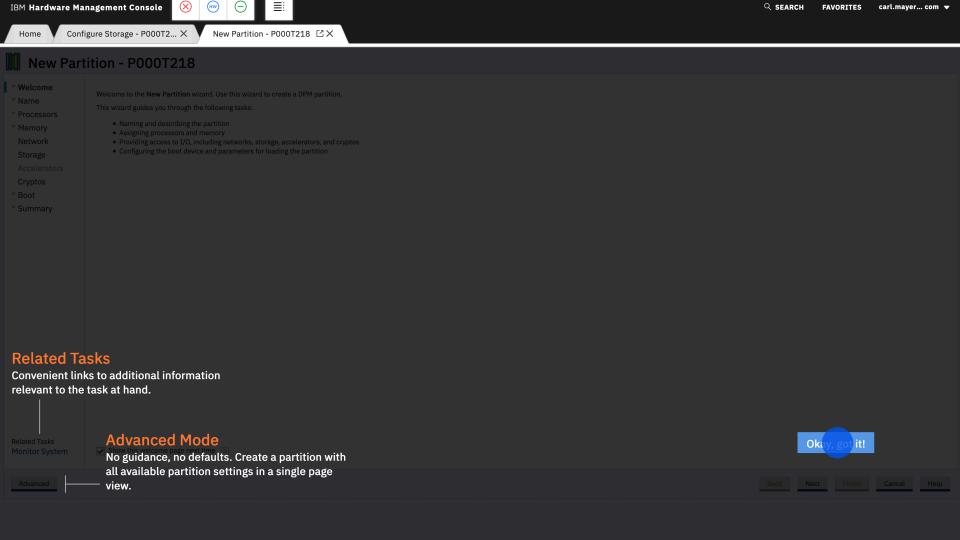
Connection Report

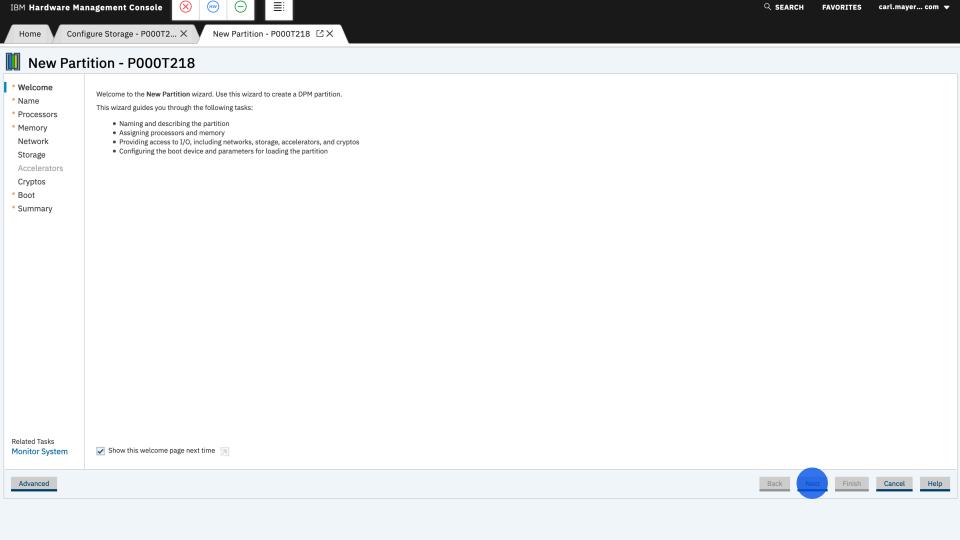
IBM Z | February 24, 2020 | © 2020 IBM Corporation

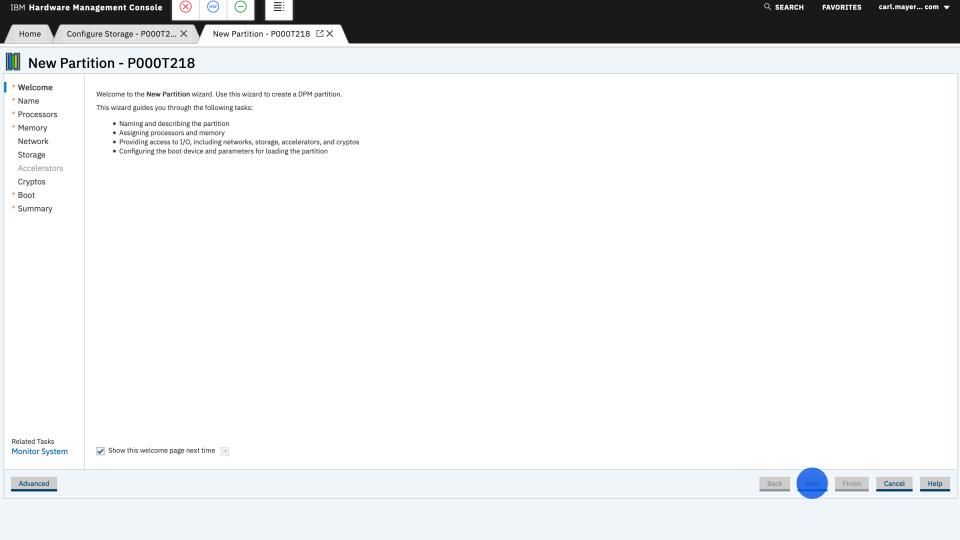
New Partition

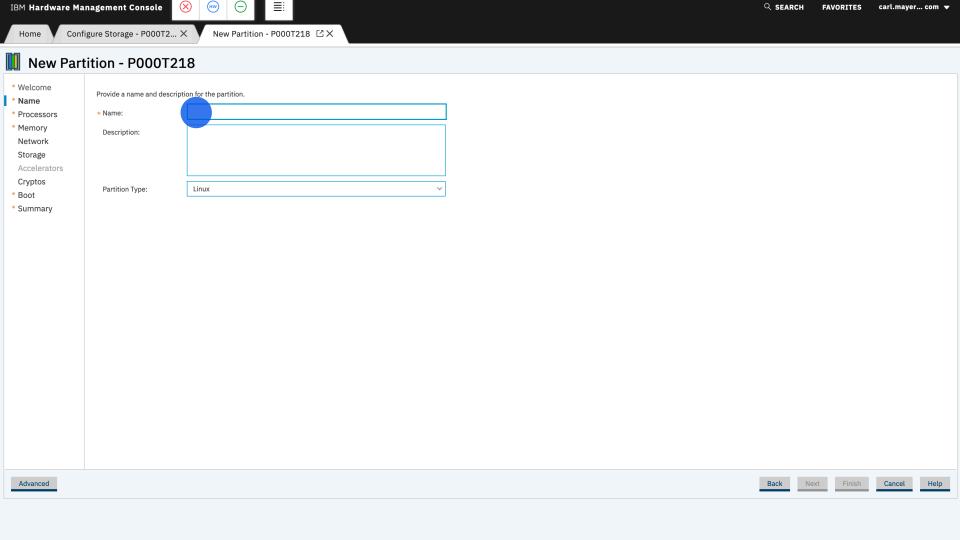


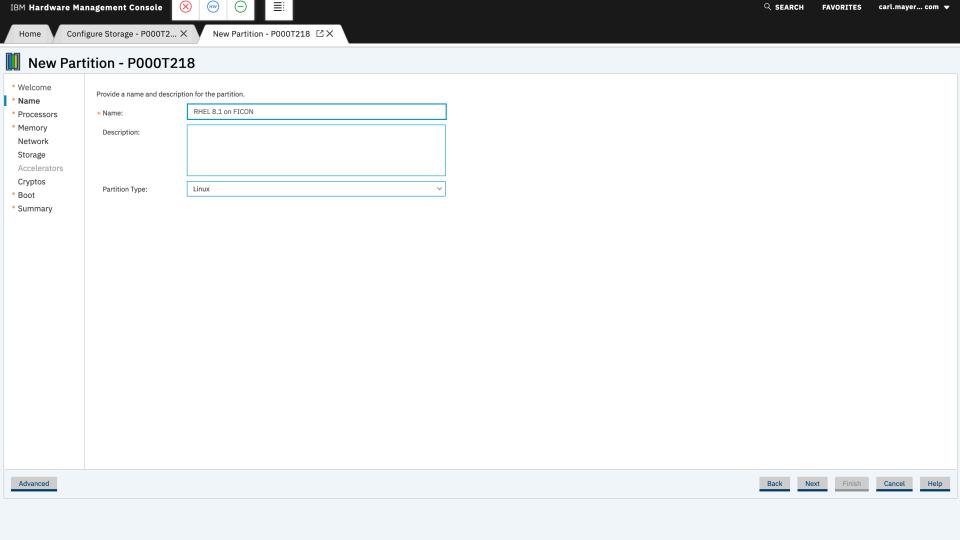


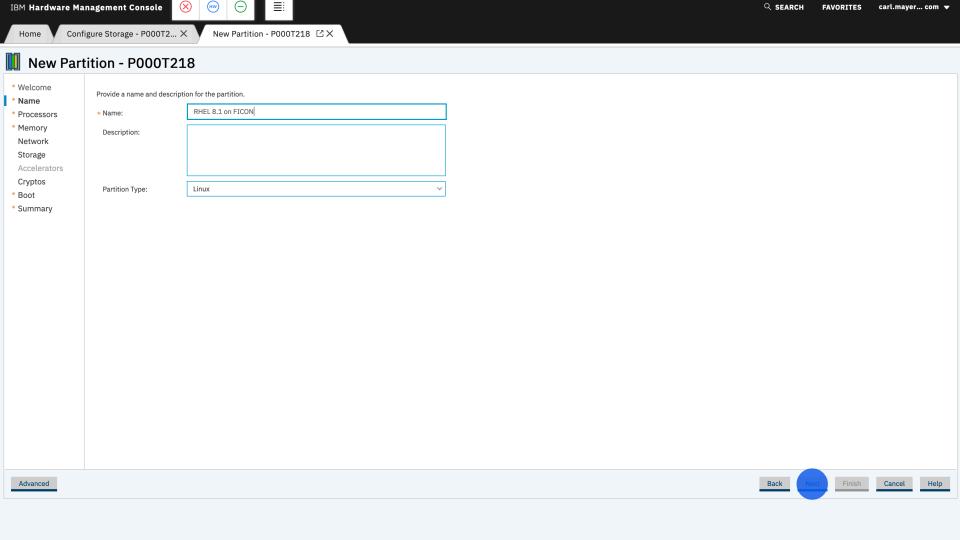


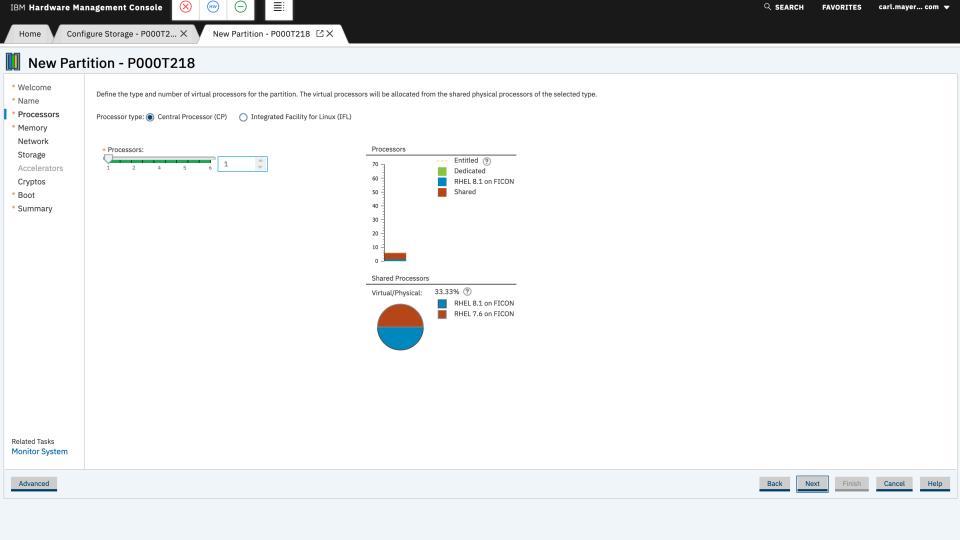


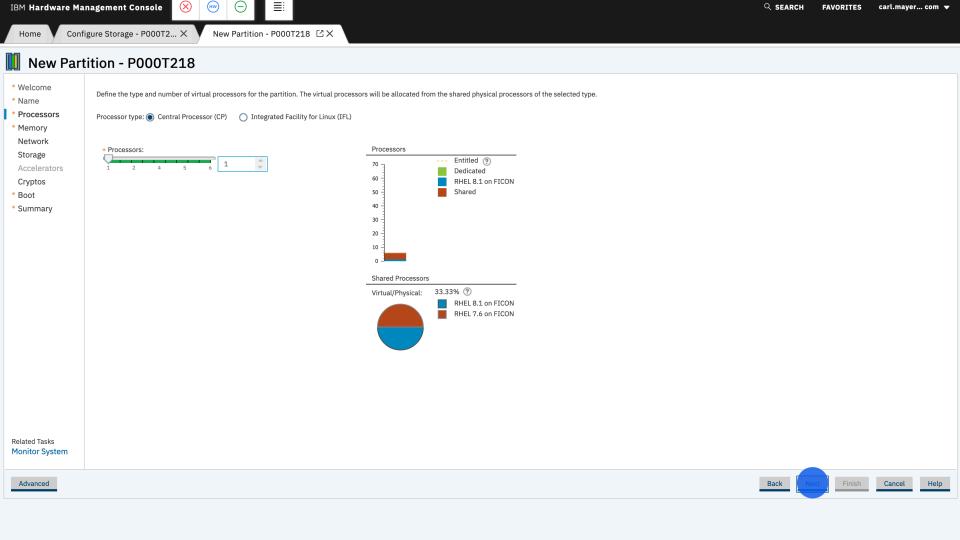


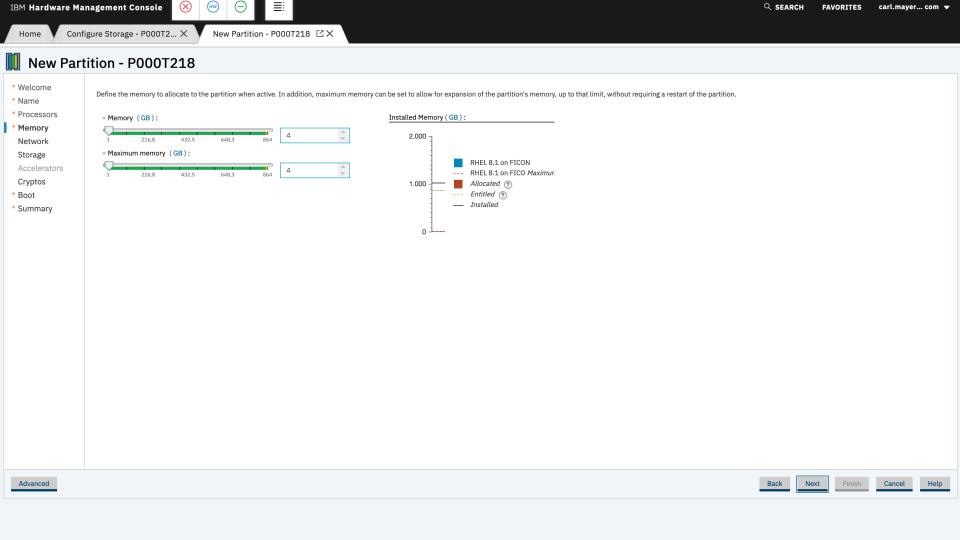


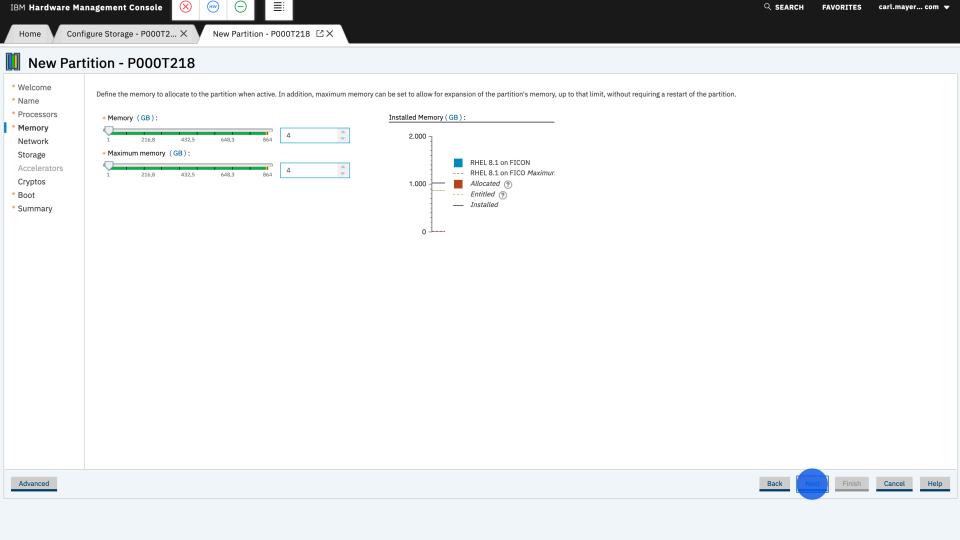


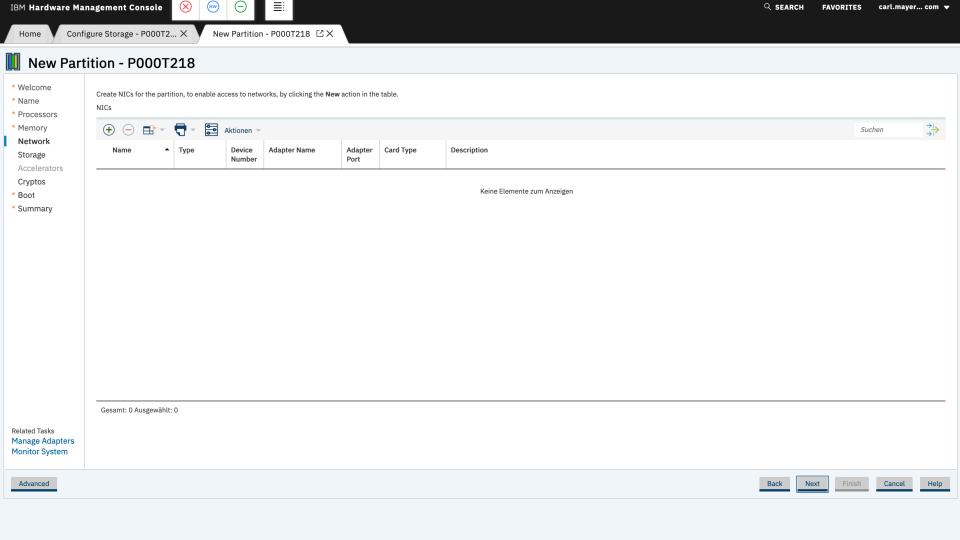


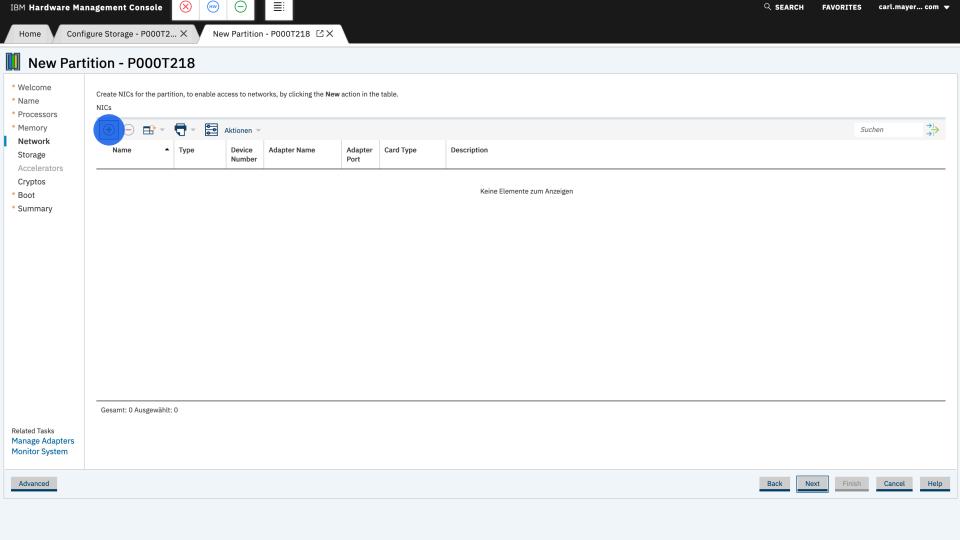


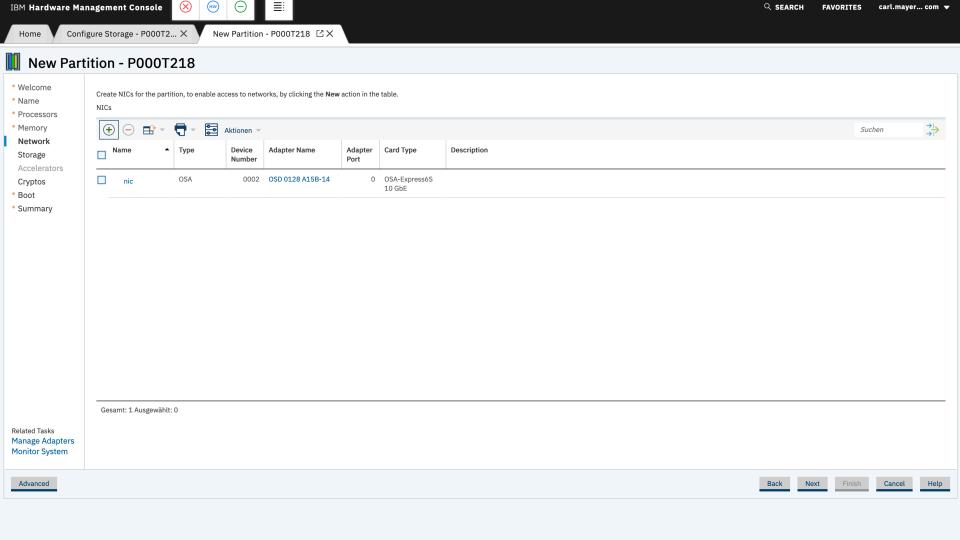


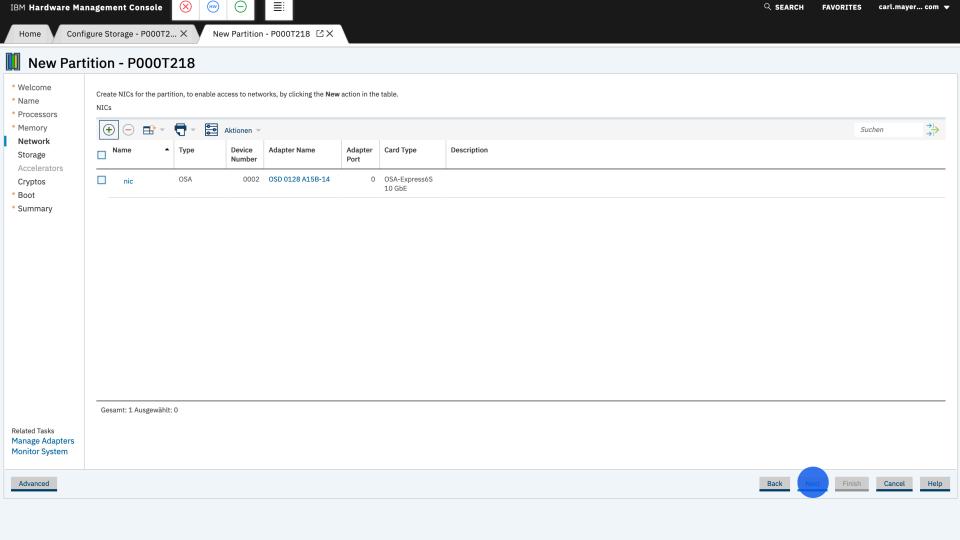


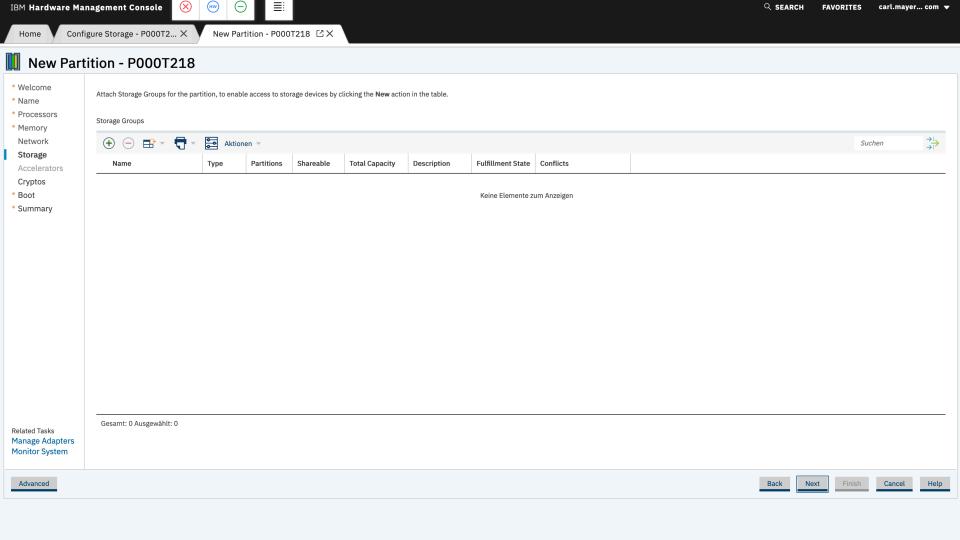


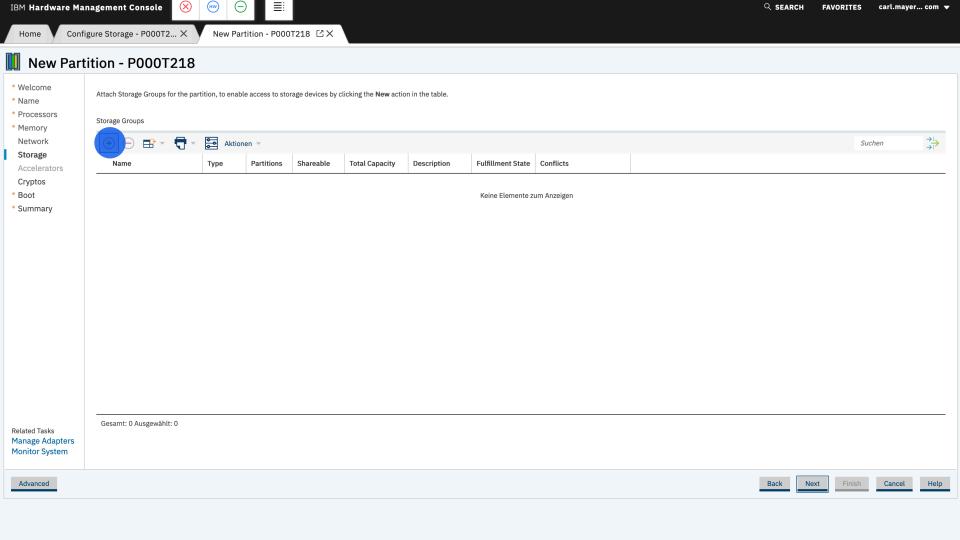


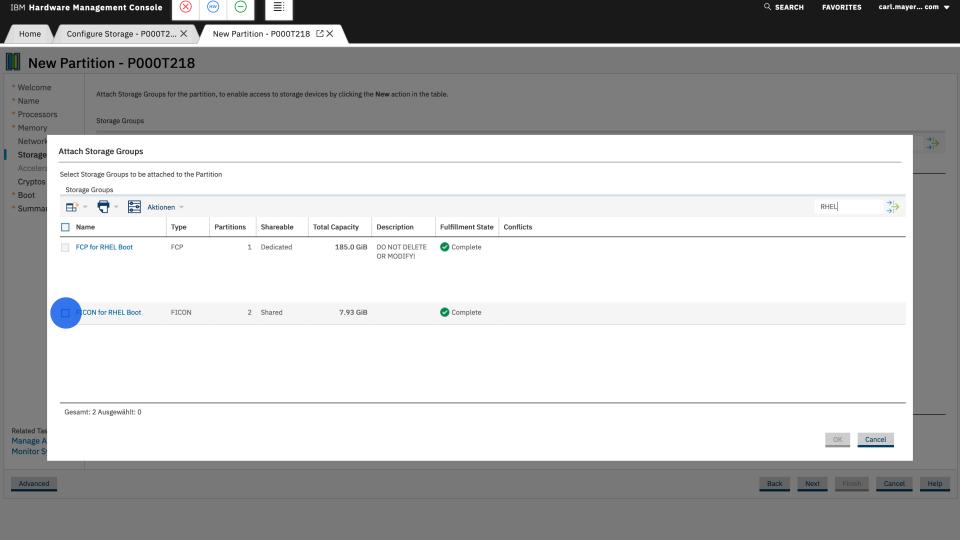


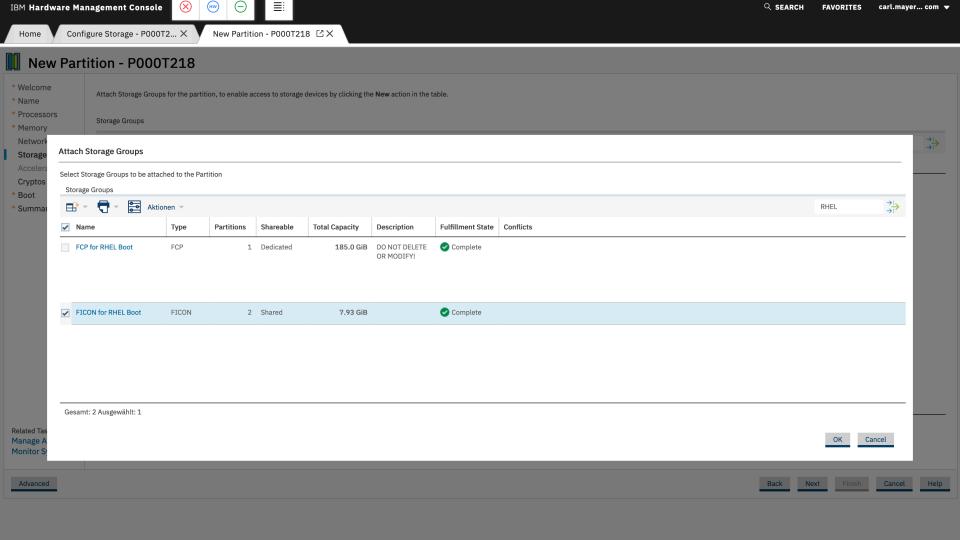


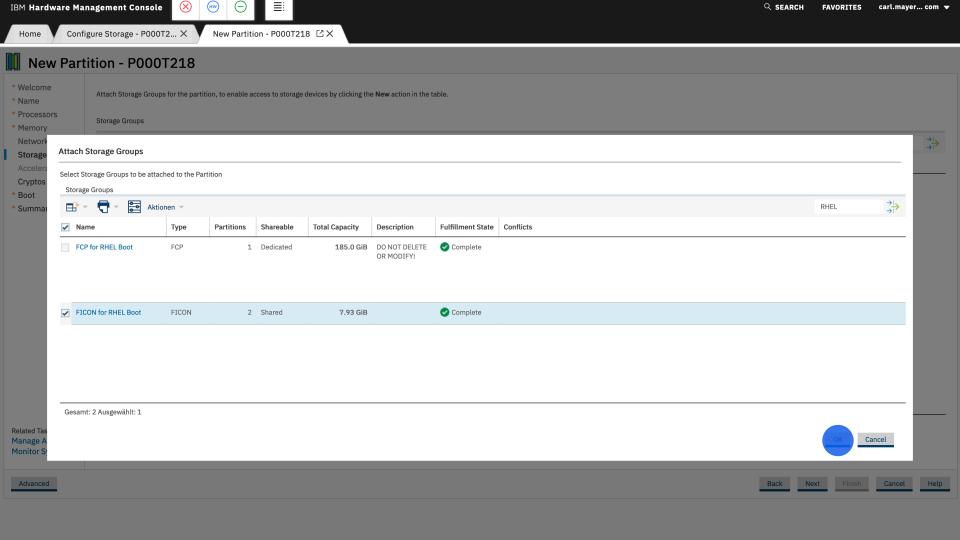


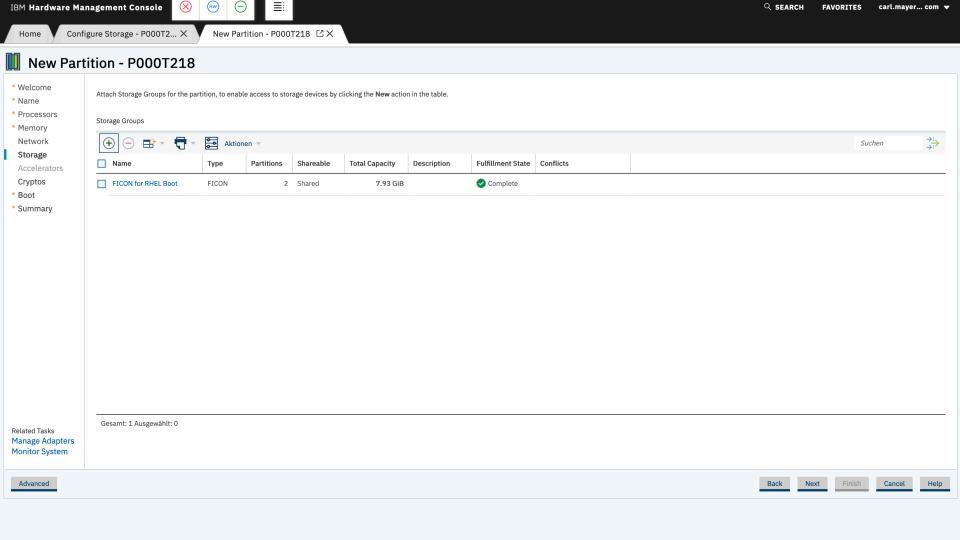


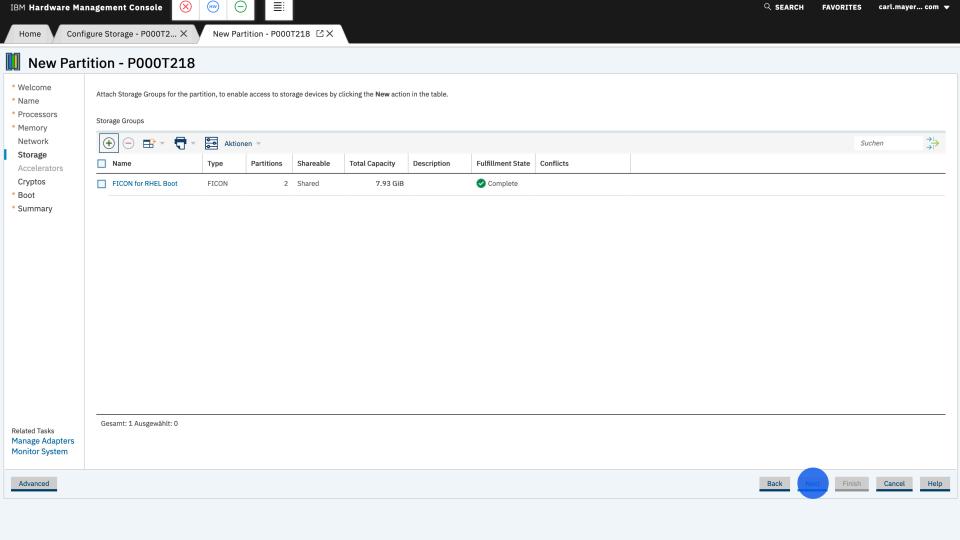


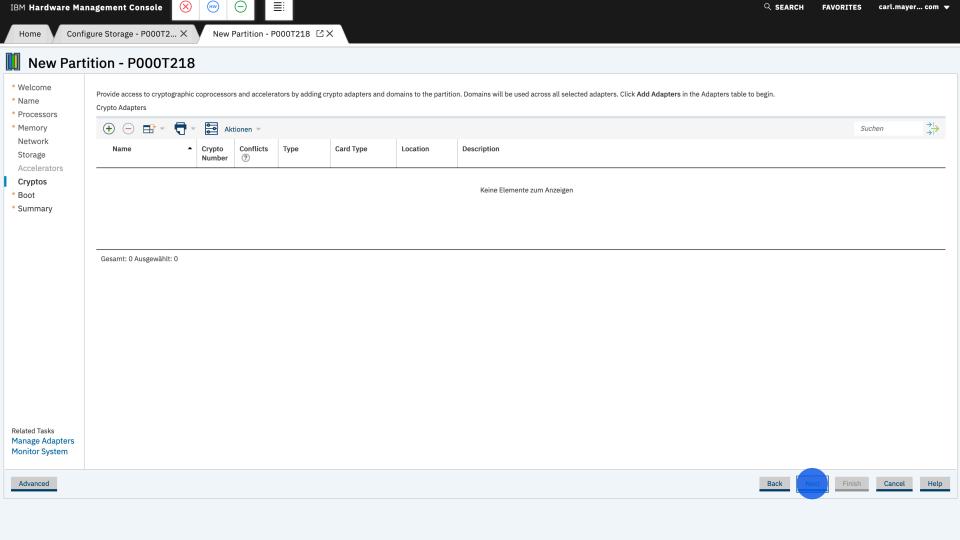


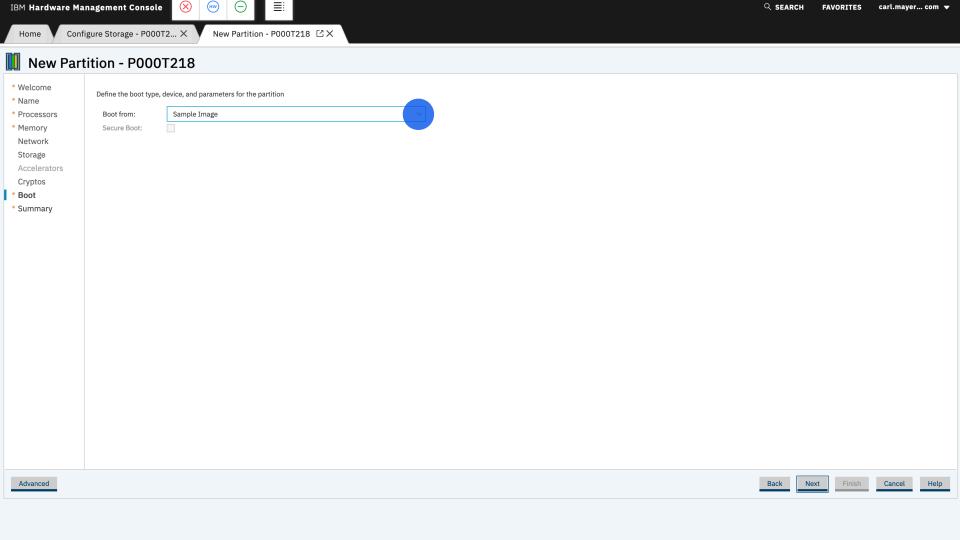


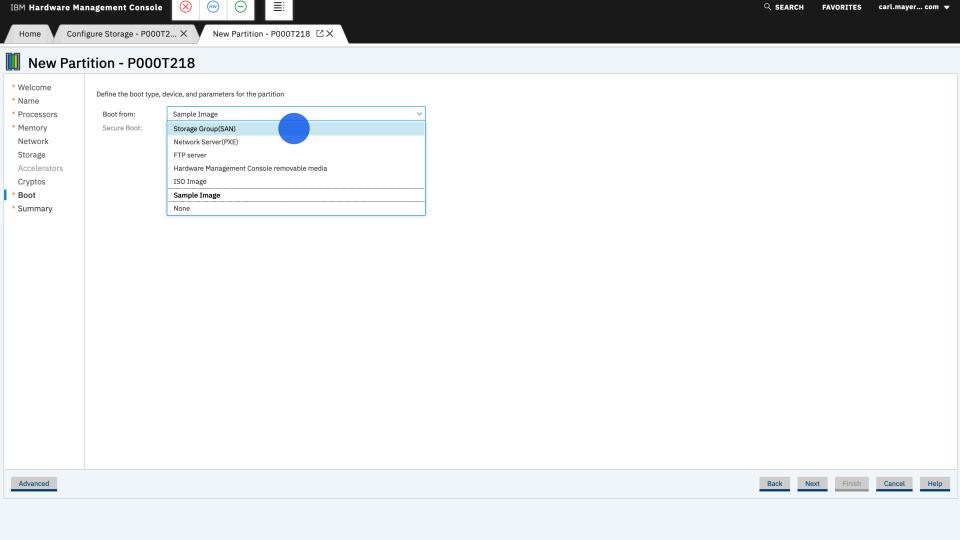


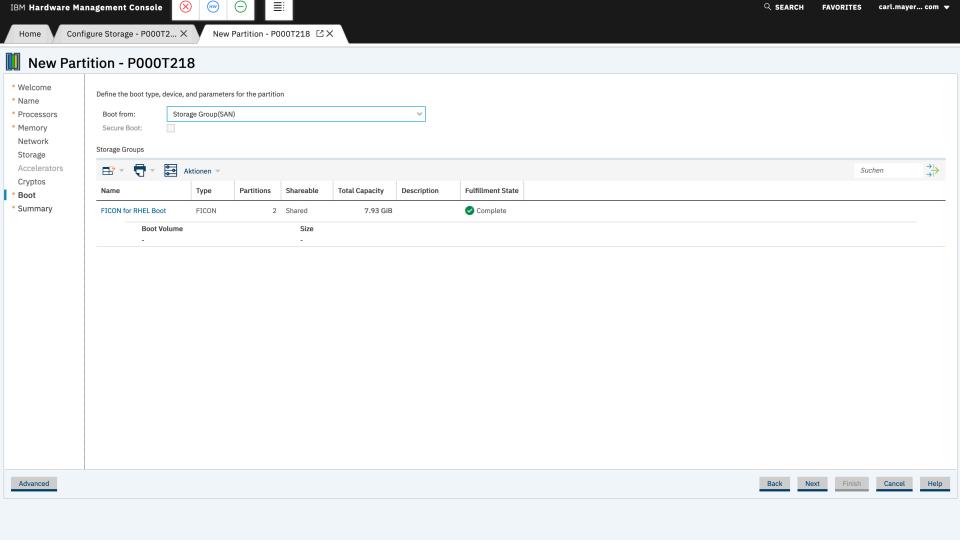


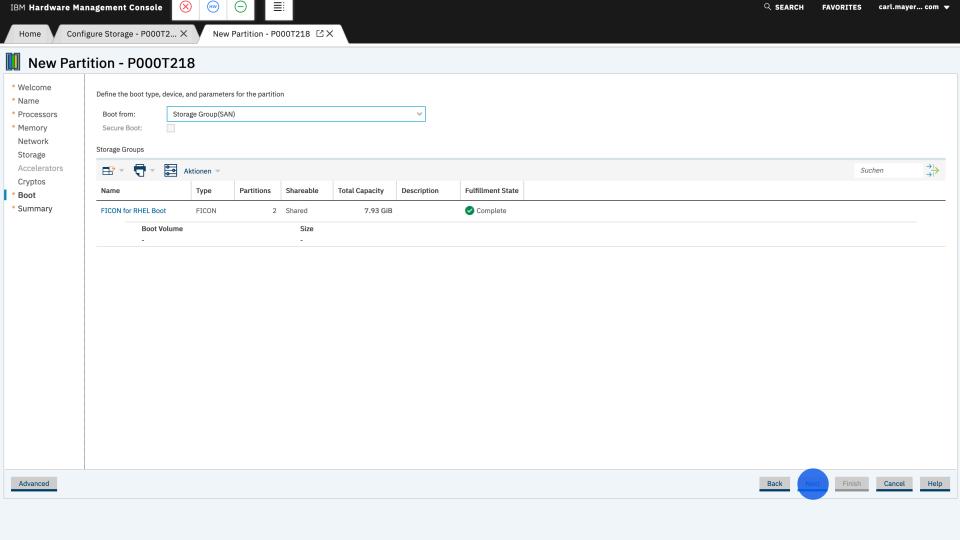


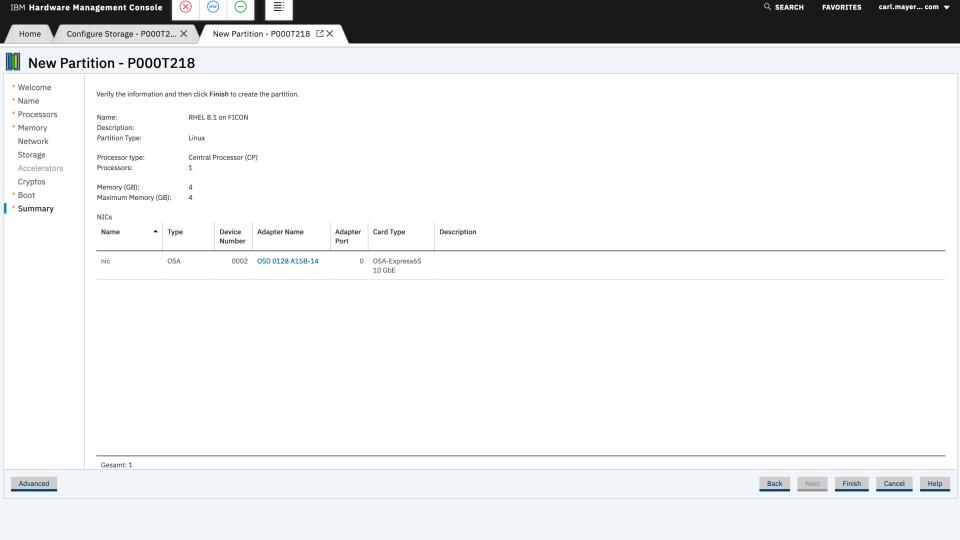


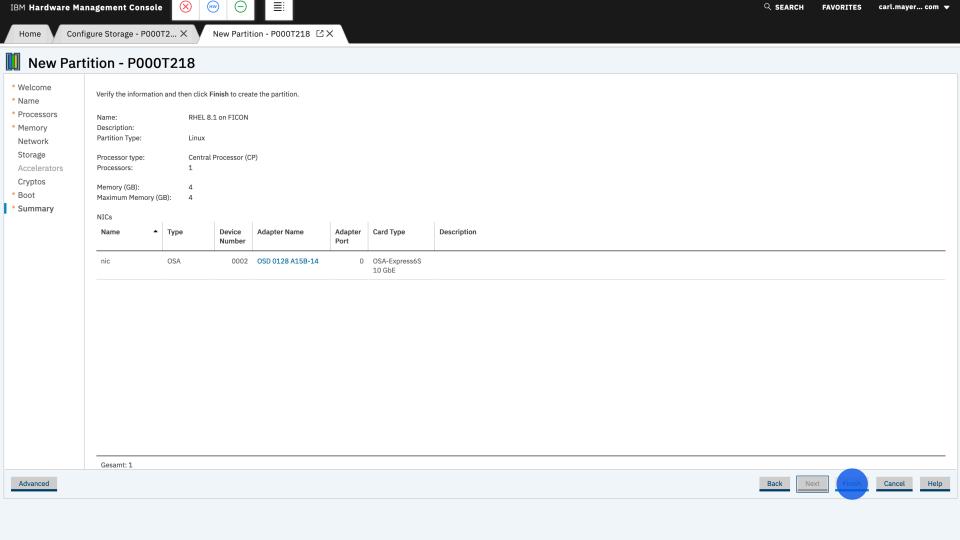


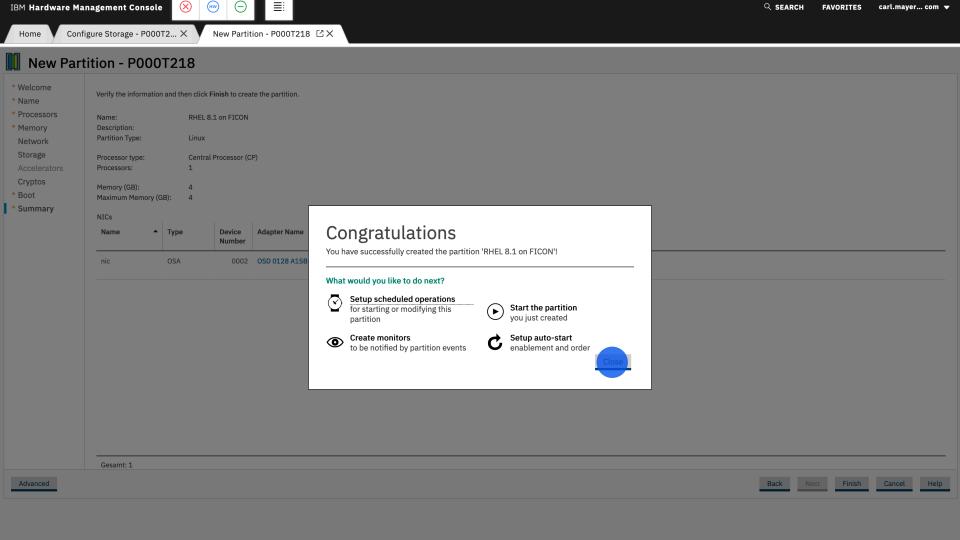




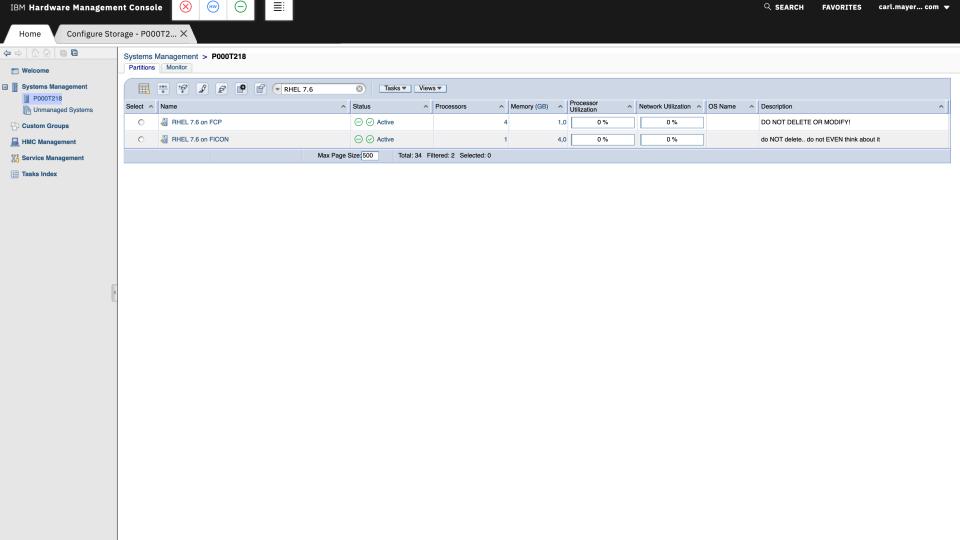


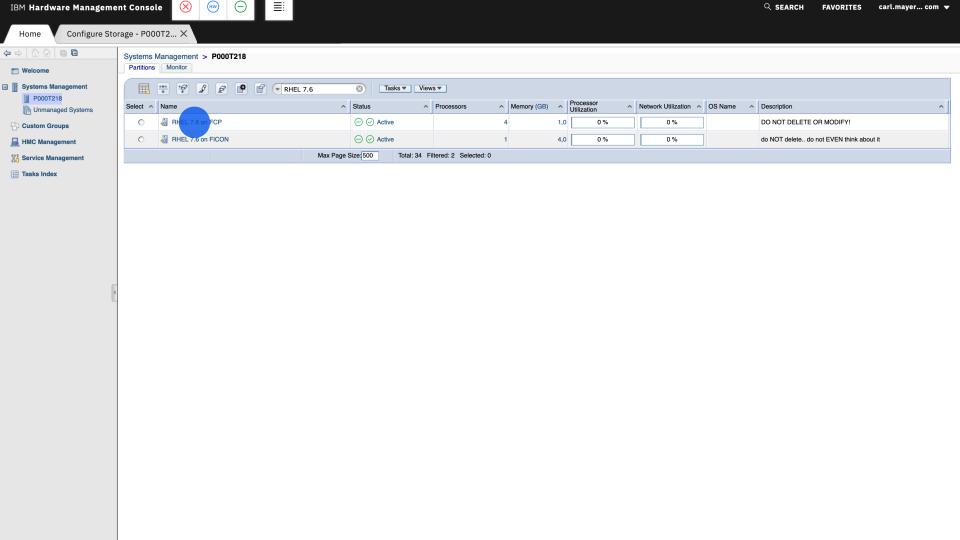




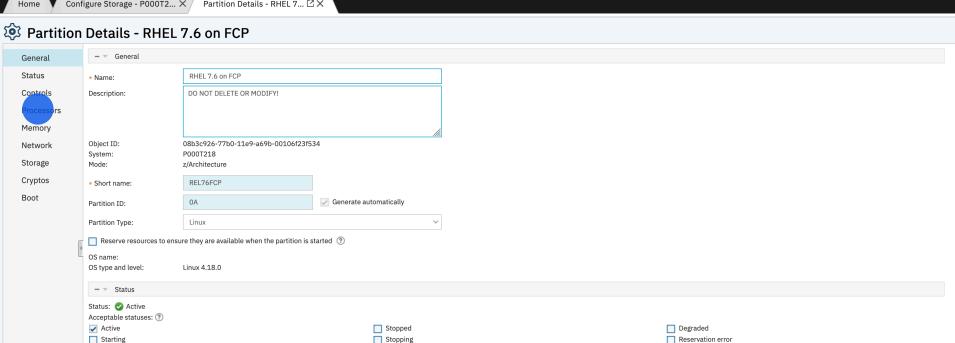


Partition Details

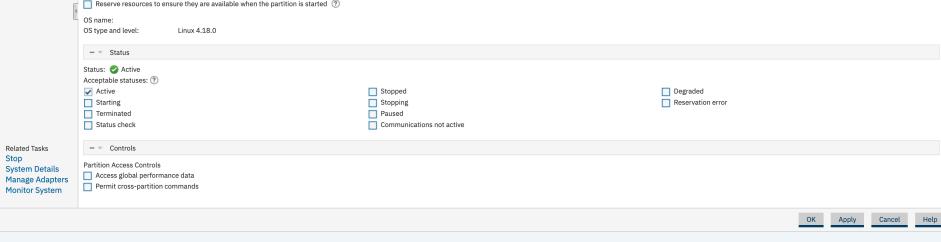


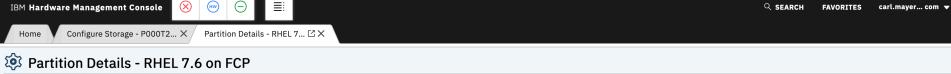


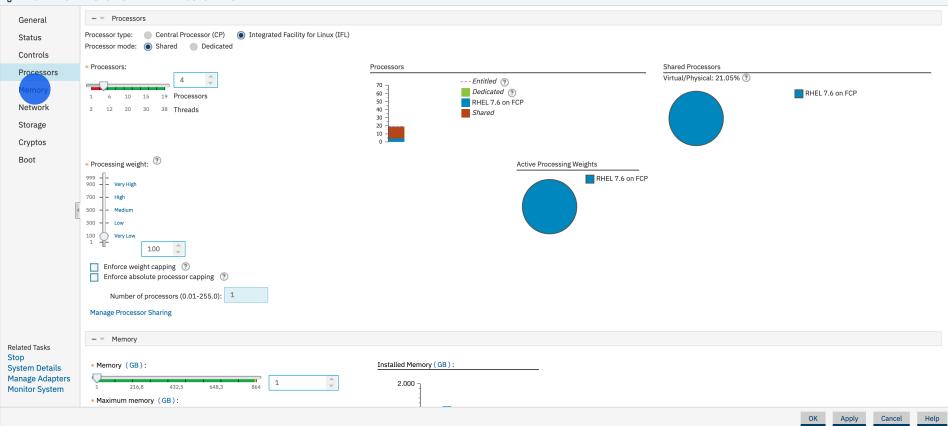


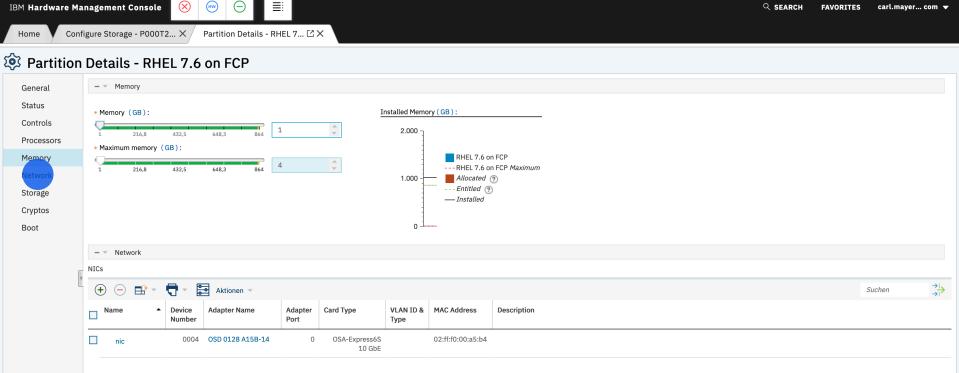


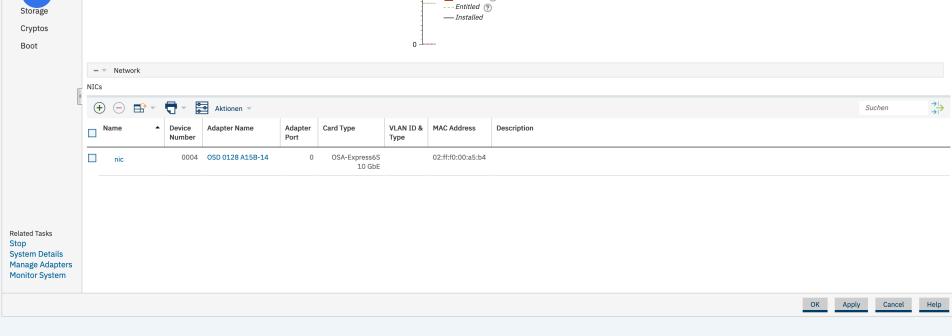
carl.mayer... com ▼

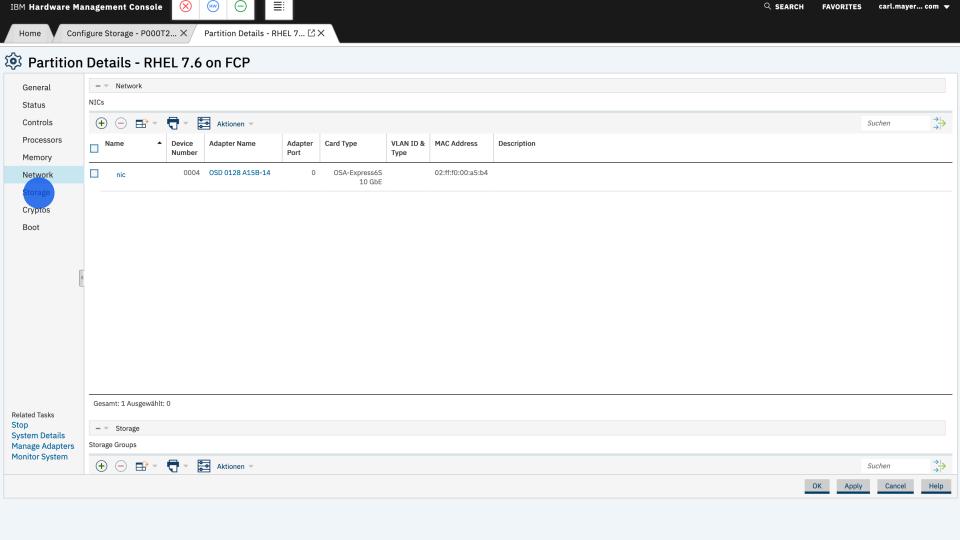


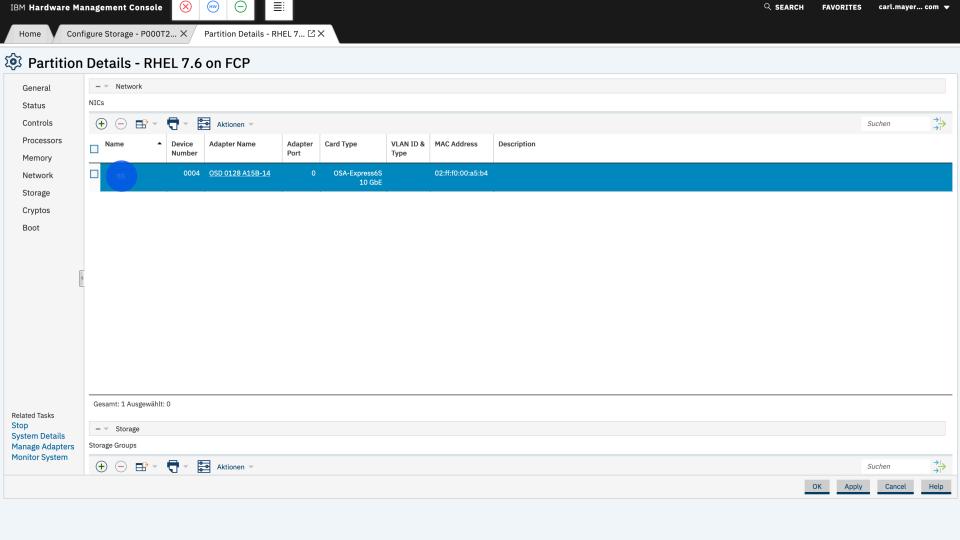


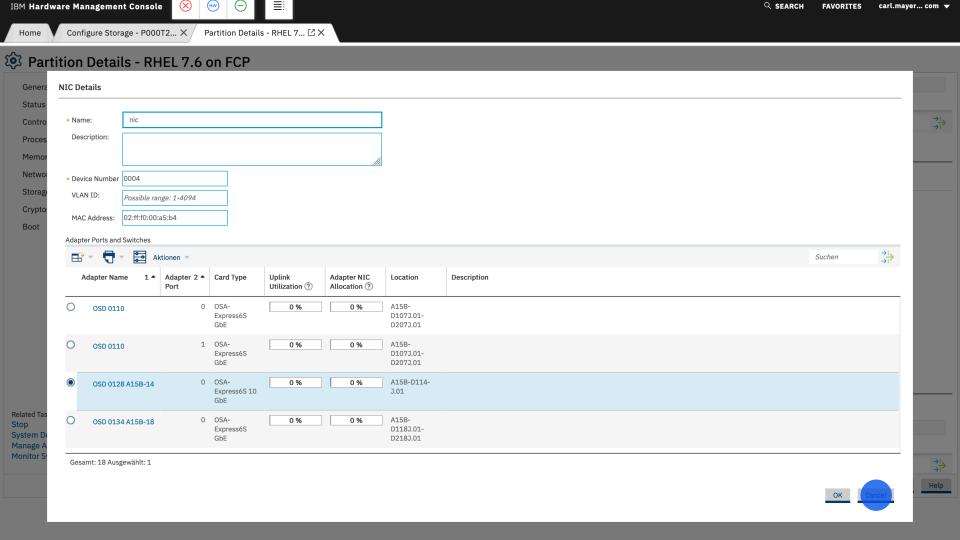


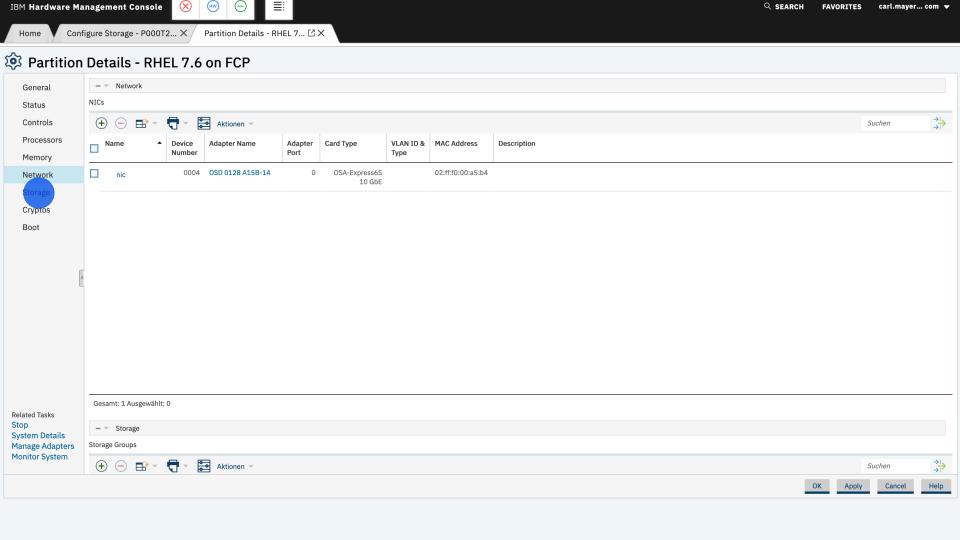


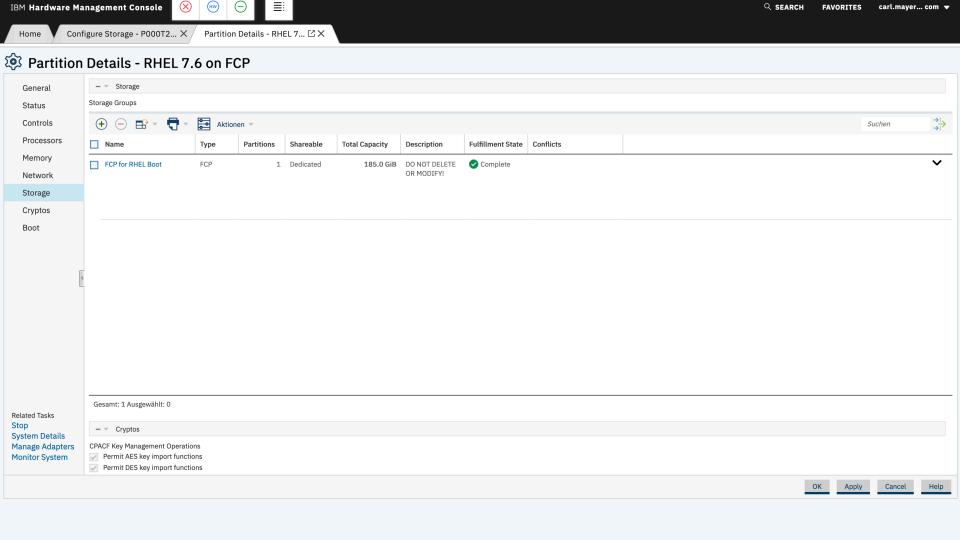


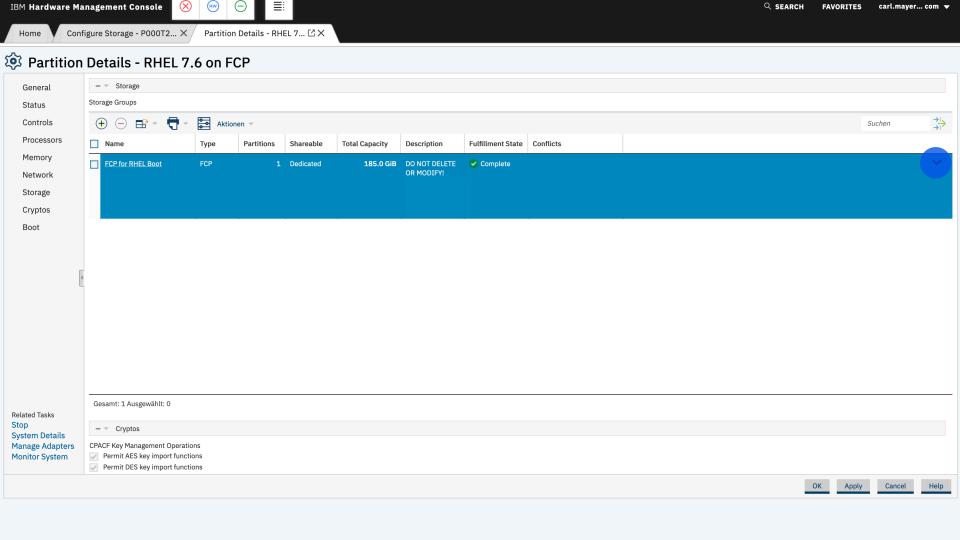


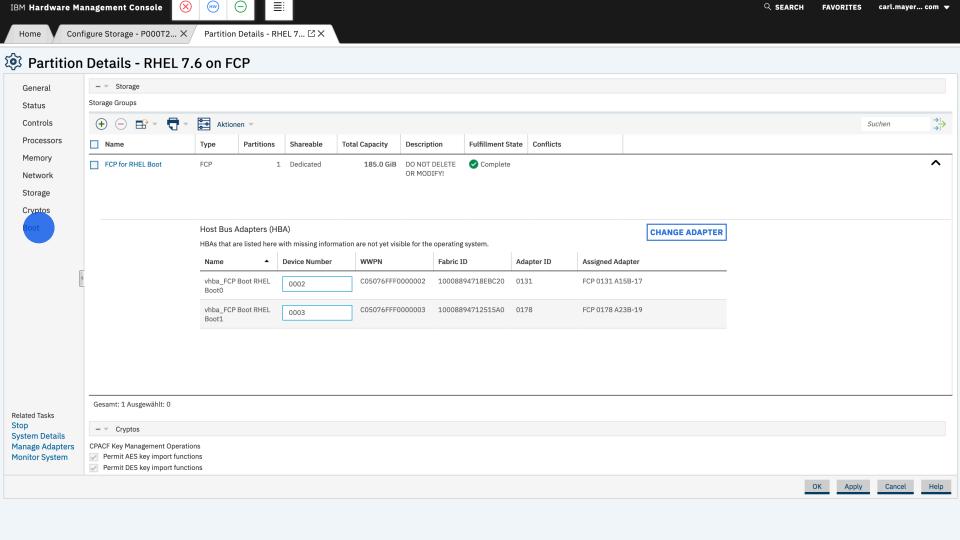


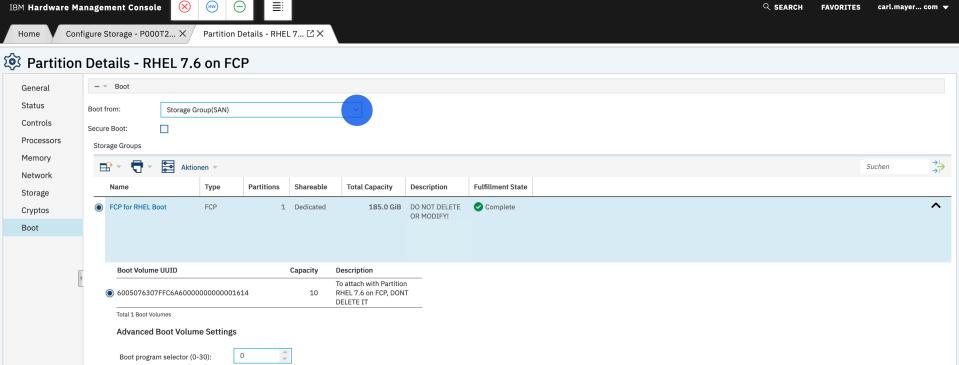


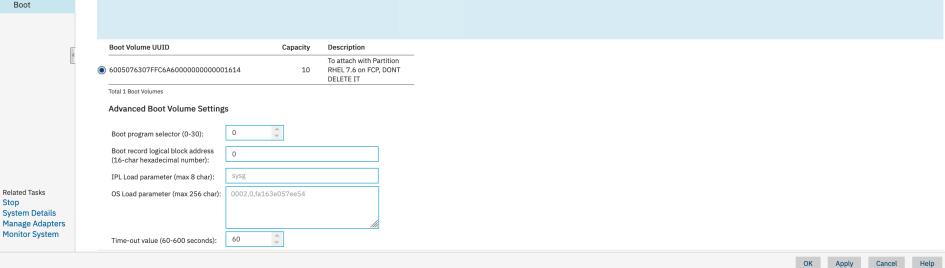






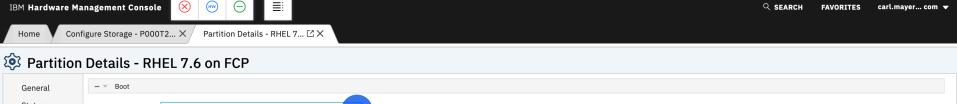


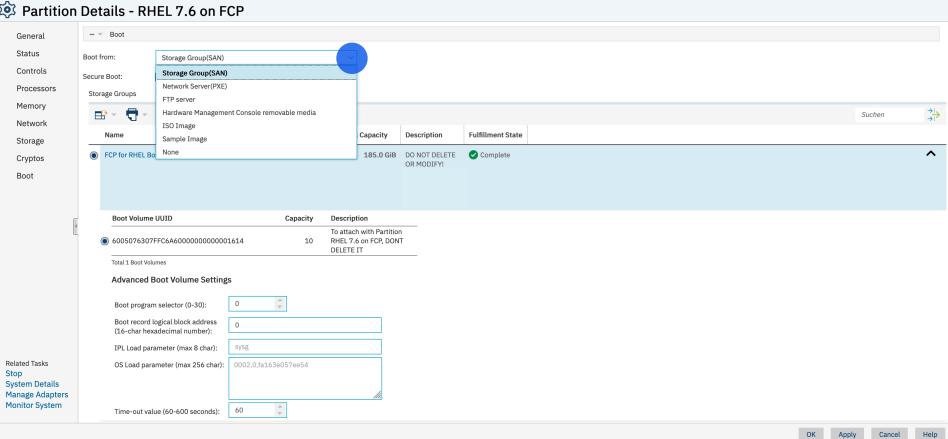


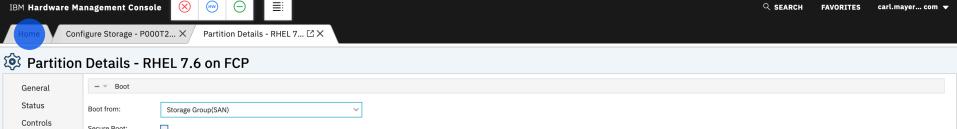


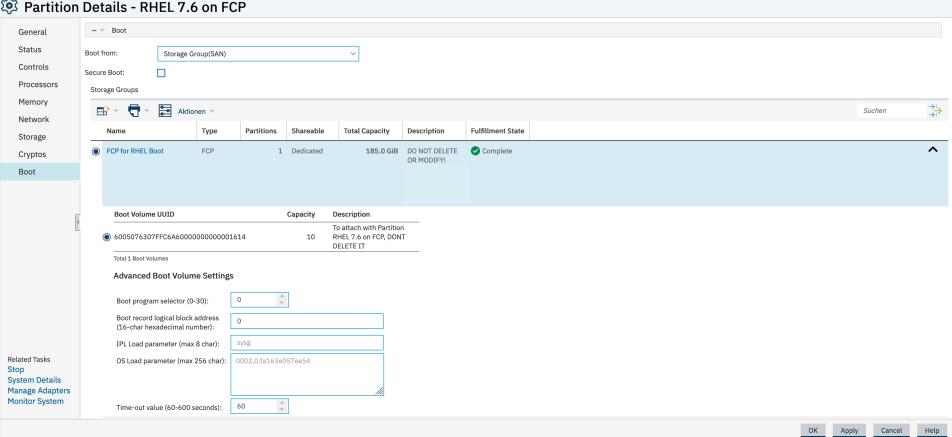
Related Tasks

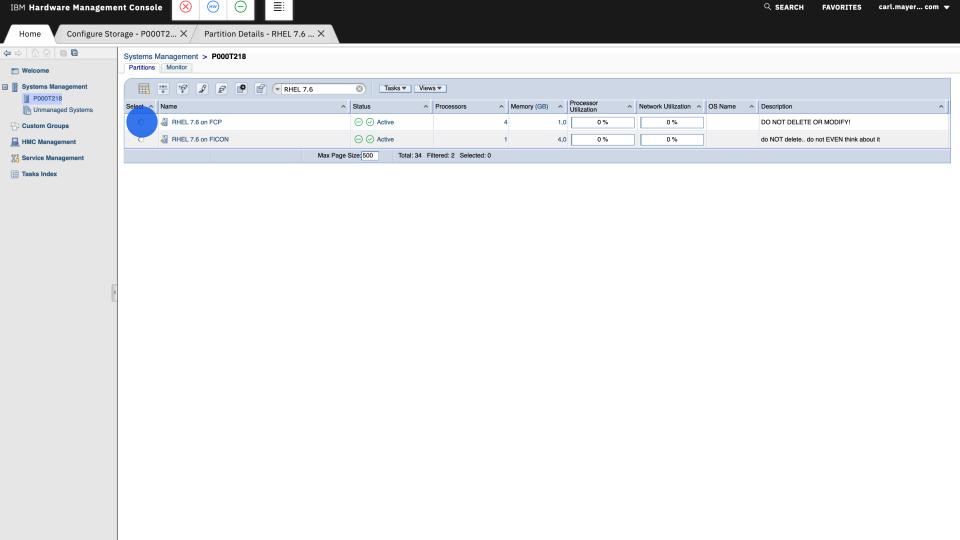
Stop

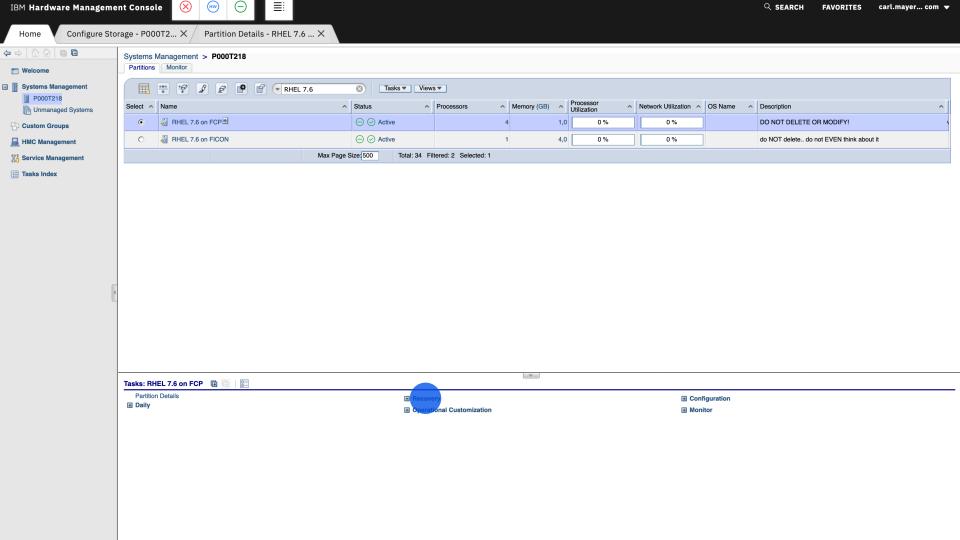


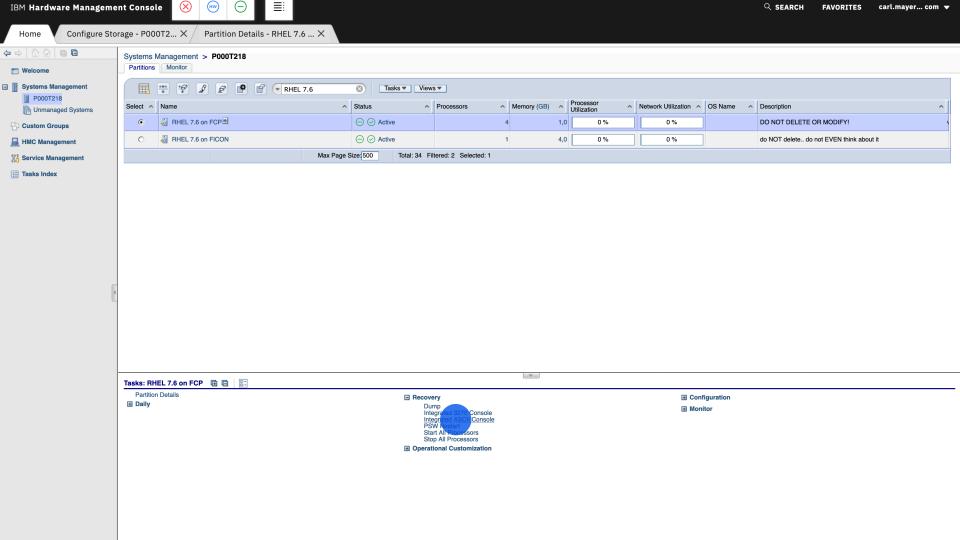


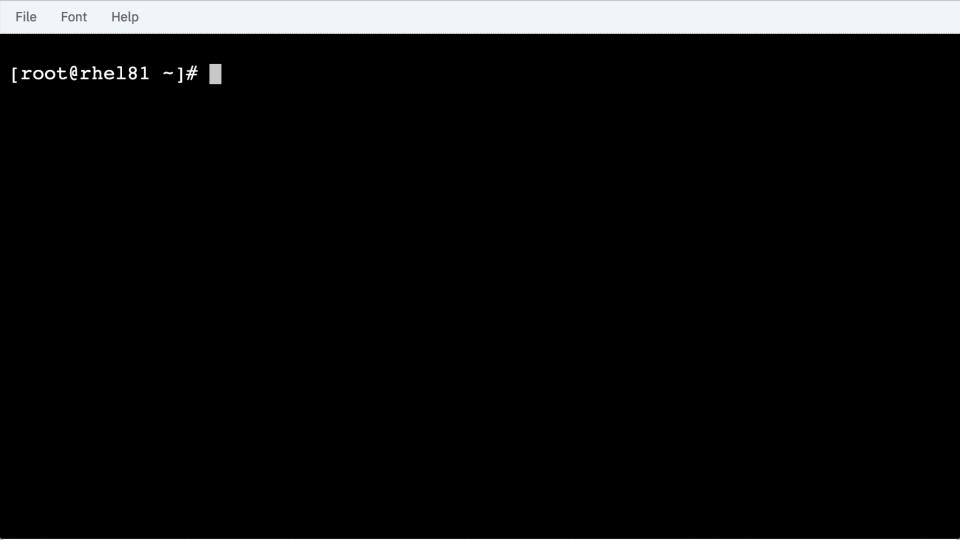


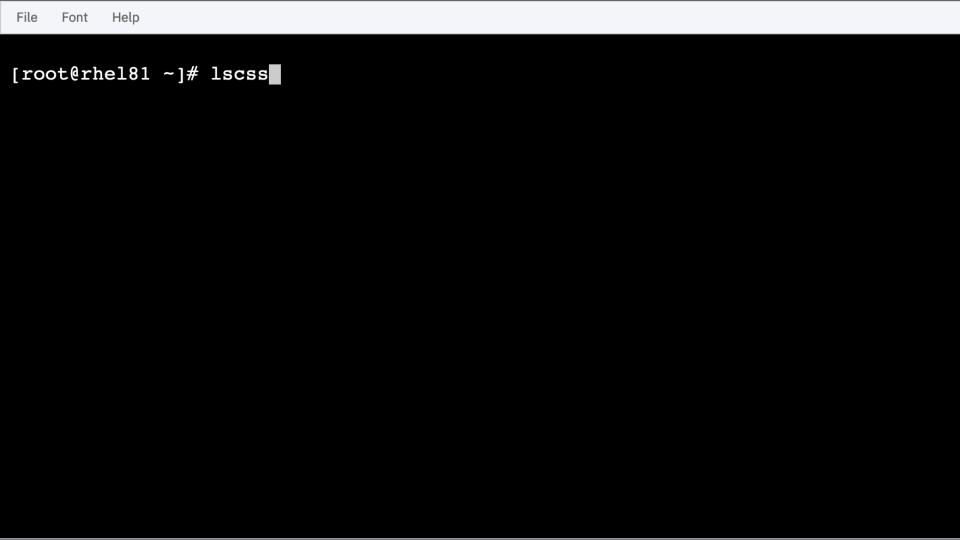












```
[root@rhel81 ~]# lscss
Device
         Subchan. DevType CU Type Use
                                        PIM PAM POM
                                                      CHPIDs
                                                      0000000000000000
0.0.0004 0.0.0000
                   1732/01 1731/01 yes
                                             80
                                                 ff
                                         80
                   1732/01 1731/01 yes
0.0.0005 0.0.0001
                                             80
                                                 ff
                                                      0000000 00000000
                                         80
                   1732/01 1731/01 yes
0.0.0006 0.0.0002
                                         80
                                             80
                                                 ff
                                                      0000000
                                                               0000000
0.0.0002 0.0.0005
                   1732/03 1731/03 yes
                                         80
                                                 ff
                                                      15000000 00000000
                                             80
0.0.0003 0.0.0006
                   1732/03 1731/03 yes
                                        80
                                             80
                                                 ff
                                                      1a000000 00000000
[root@rhel81 ~]#
```

File

Font

Help

```
[root@rhel81 ~]# lscss
Device
         Subchan. DevType CU Type Use
                                        PIM PAM POM
                                                      CHPIDs
0.0.0004 0.0.0000
                   1732/01 1731/01 yes
                                             80
                                                 ff
                                                      0000000 00000000
                                         80
0.0.0005 0.0.0001
                   1732/01 1731/01 yes
                                             80
                                                ff
                                                      0000000 00000000
                                         80
                   1732/01 1731/01 yes
0.0.0006 0.0.0002
                                         80
                                             80
                                                ff
                                                      0000000
                                                               0000000
0.0.0002 0.0.0005
                   1732/03 1731/03 yes
                                         80
                                                ff
                                                      15000000 00000000
                                             80
0.0.0003 0.0.0006
                  1732/03 1731/03 yes
                                        80
                                             80
                                                ff
                                                      1a000000 00000000
[root@rhel81 ~]# lsmem
```

File

Font

Help

```
[root@rhel81 ~]# lscss
         Subchan. DevType CU Type Use PIM PAM POM
Device
                                                      CHPIDs
0.0.0004 0.0.0000
                   1732/01 1731/01 yes
                                             80
                                                 ff
                                                      0000000 00000000
                                         80
                   1732/01 1731/01 yes
0.0.0005 0.0.0001
                                                 ff
                                                      0000000 00000000
                                         80
                                             80
0.0.0006 \ 0.0.0002
                   1732/01 1731/01 yes
                                         80
                                             80
                                                 ff
                                                      0000000
                                                              00000000
0.0.0002 0.0.0005 1732/03 1731/03 yes
                                         80
                                                ff
                                                      15000000 00000000
                                             80
0.0.0003 0.0.0006 1732/03 1731/03 yes
                                                 ff
                                                      1a000000 00000000
                                         80
                                             80
[root@rhel81 ~]# lsmem
RANGE
                                       SIZE
                                             STATE REMOVABLE BLOCK
0x00000000000000000-0x00000003fffffff
                                         1G
                                            online
                                                           no
0x000000040000000-0x00000017fffffff
                                         5G offline
                                                                1-5
Memory block size:
                           1G
Total online memory:
                           1G
Total offline memory:
                           5G
[root@rhel81 ~]#
```

File

Font

Help

```
[root@rhel81 ~]# lscss
         Subchan. DevType CU Type Use PIM PAM POM
Device
                                                      CHPIDs
0.0.0004 0.0.0000
                   1732/01 1731/01 yes
                                             80
                                                 ff
                                                      0000000 00000000
                                         80
                   1732/01 1731/01 yes
0.0.0005 0.0.0001
                                                 ff
                                                      0000000 00000000
                                         80
                                             80
0.0.0006 \ 0.0.0002
                   1732/01 1731/01 yes
                                         80
                                             80
                                                 ff
                                                      0000000
                                                               00000000
0.0.0002 0.0.0005 1732/03 1731/03 yes
                                         80
                                                 ff
                                                      15000000 00000000
                                             80
0.0.0003 0.0.0006 1732/03 1731/03 yes
                                                 ff
                                                      1a000000 00000000
                                         80
                                             80
[root@rhel81 ~]# lsmem
RANGE
                                       SIZE
                                             STATE REMOVABLE BLOCK
0x00000000000000000-0x00000003fffffff
                                         1G
                                             online
                                                           no
0x000000040000000-0x00000017fffffff
                                         5G offline
                                                                1-5
Memory block size:
                           1G
Total online memory:
                           1G
```

5G

File

Font

Help

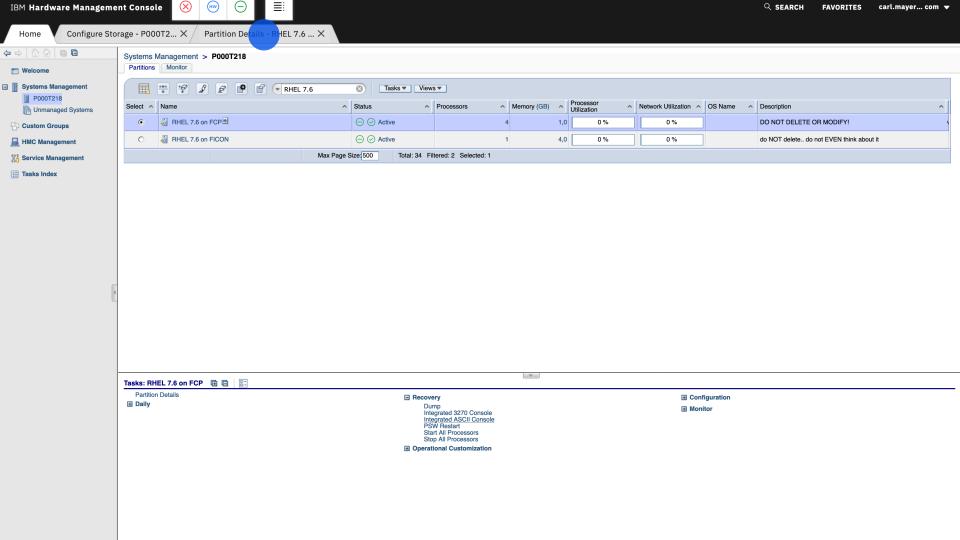
Total offline memory:

[root@rhel81 ~]# lscpu

```
File
    Font
         Help
                      12
Core(s) per socket:
Socket(s) per book:
Book(s) per drawer:
                      5
Drawer(s):
NUMA node(s):
Vendor ID:
                      IBM/S390
Machine type:
                      8562
CPU dynamic MHz:
                      4500
CPU static MHz:
                      4500
BogoMIPS:
                      18656.00
Hypervisor:
                      PR/SM
Hypervisor vendor:
                      IBM
Virtualization type: full
Dispatching mode:
                      horizontal
Lld cache:
                      128K
Lli cache:
                      128K
L2d cache:
                      4096K
L2i cache:
                      4096K
                      262144K
L3 cache:
L4 cache:
                      983040K
NUMA node0 CPU(s):
                      0 - 7
                      esan3 zarch stfle msa ldisp eimm dfp edat etf3eh highgprs t
Flags:
e vx vxd vxe gs vxe2 vxp sort dflt sie
[root@rhel81 ~]#
```

```
File
    Font
         Help
                      12
Core(s) per socket:
Socket(s) per book:
Book(s) per drawer:
                      5
Drawer(s):
NUMA node(s):
Vendor ID:
                      IBM/S390
Machine type:
                      8562
CPU dynamic MHz:
                      4500
CPU static MHz:
                      4500
BogoMIPS:
                      18656.00
Hypervisor:
                      PR/SM
Hypervisor vendor:
                      IBM
Virtualization type: full
Dispatching mode:
                      horizontal
Lld cache:
                      128K
Lli cache:
                      128K
L2d cache:
                      4096K
L2i cache:
                      4096K
                      262144K
L3 cache:
L4 cache:
                      983040K
NUMA node0 CPU(s):
                      0 - 7
                      esan3 zarch stfle msa ldisp eimm dfp edat etf3eh highgprs t
Flags:
e vx vxd vxe gs vxe2 vxp sort dflt sie
[root@rhel81 ~]# lscpu
                          more
```

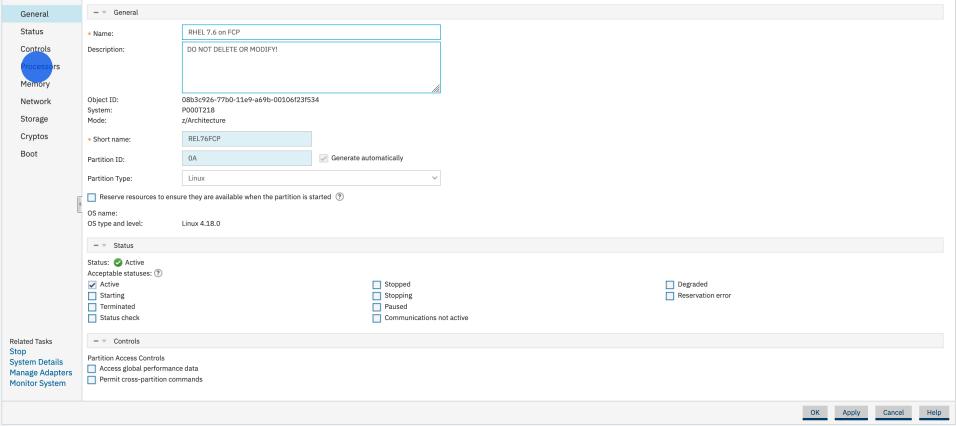
```
File
    Font
         Help
Architecture:
                      s390x
CPU op-mode(s):
                      32-bit, 64-bit
                      Big Endian
Byte Order:
CPU(s):
On-line CPU(s) list: 0-7
Thread(s) per core:
Core(s) per socket:
Socket(s) per book:
Book(s) per drawer:
Drawer(s):
                      5
NUMA node(s):
Vendor ID:
                      IBM/S390
Machine type:
                      8562
CPU dynamic MHz:
                      4500
CPU static MHz:
                      4500
BogoMIPS:
                      18656.00
Hypervisor:
                      PR/SM
Hypervisor vendor:
                      IBM
Virtualization type: full
                      horizontal
Dispatching mode:
Lld cache:
                      128K
Lli cache:
                      128K
L2d cache:
                      4096K
--More--
```

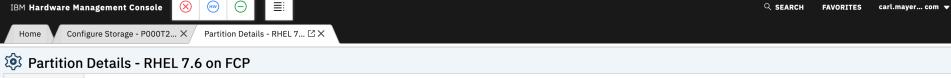


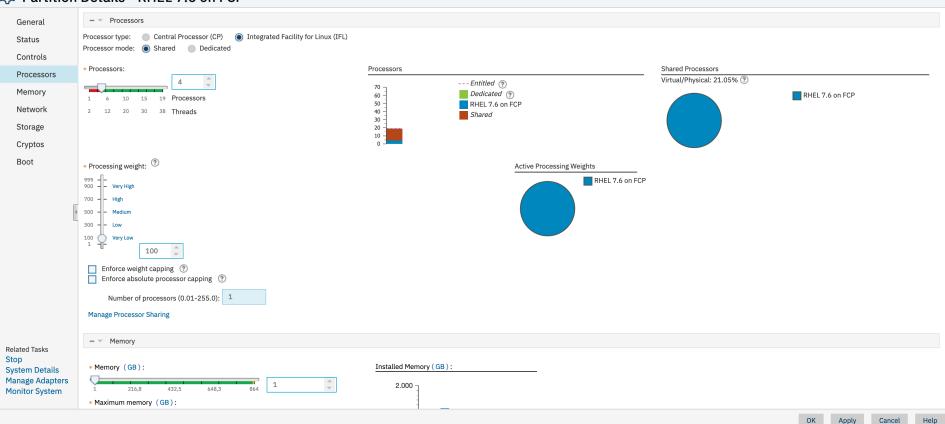


carl.mayer... com ▼

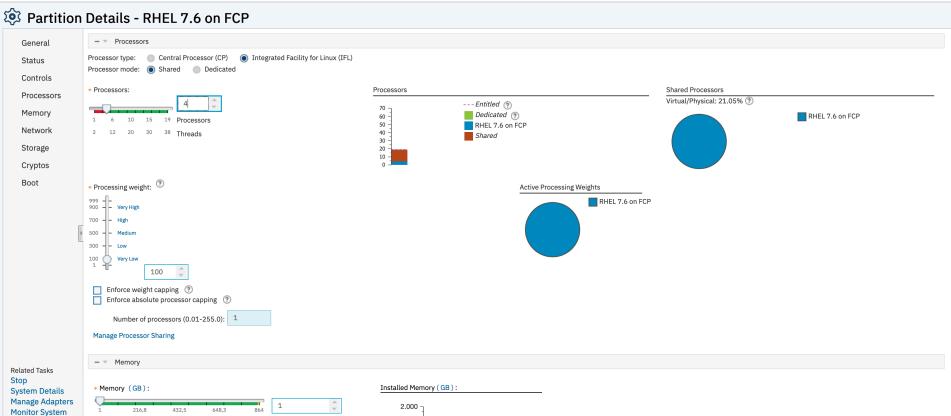
Partition Details - RHEL 7.6 on FCP







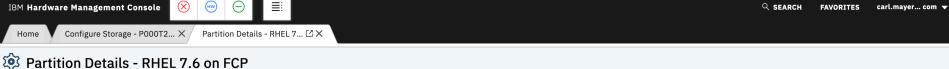




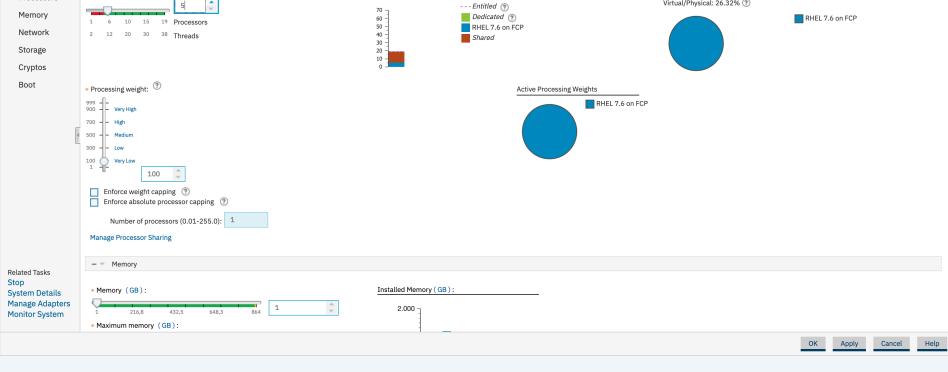
Apply

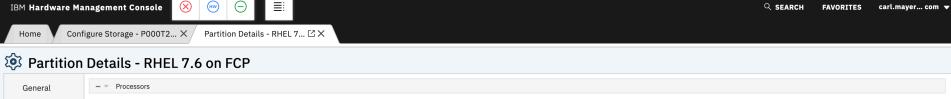
Cancel

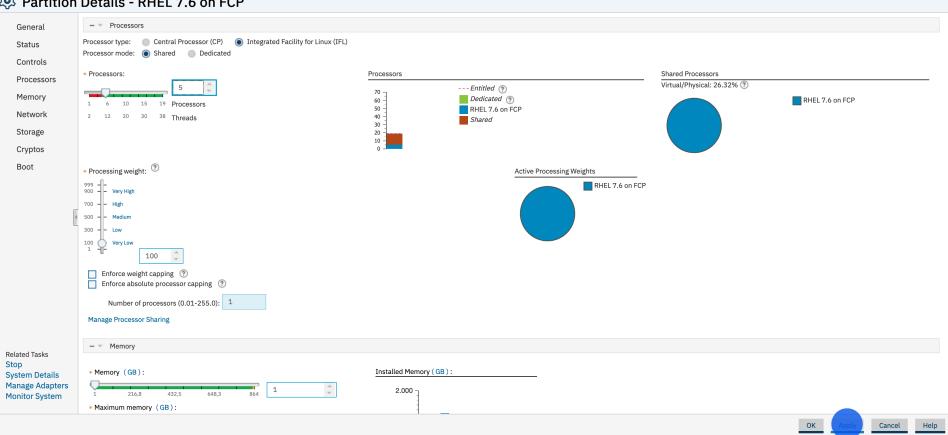
* Maximum memory (GB):



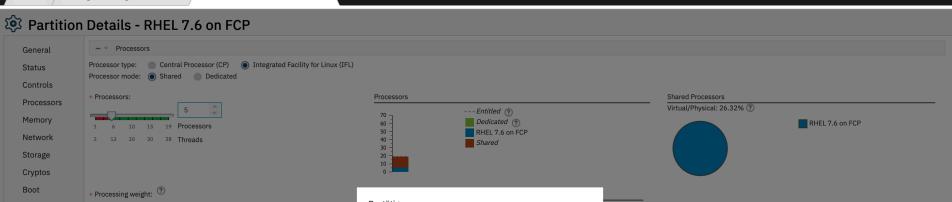
Partition Details - RHEL 7.6 on FCP Processors General Processor type: Central Processor (CP) Integrated Facility for Linux (IFL) Status Processor mode: Shared Dedicated Controls Shared Processors * Processors: Processors Processors Virtual/Physical: 26.32% (?) ---Entitled (?) Memory Dedicated (?) RHEL 7.6 on FCP 60 19 Processors 10 15 50 RHEL 7.6 on FCP Network 2 12 20 30 38 Threads 40 Shared 30 Storage 20 Cryptos Boot * Processing weight: Active Processing Weights 999 - - Very High RHEL 7.6 on FCP 700 - High 500 - Medium 300 -- Low 100 Nery Low 100 Enforce weight capping (?) Enforce absolute processor capping (?) Number of processors (0.01-255.0): 1 Manage Processor Sharing - Memory Related Tasks

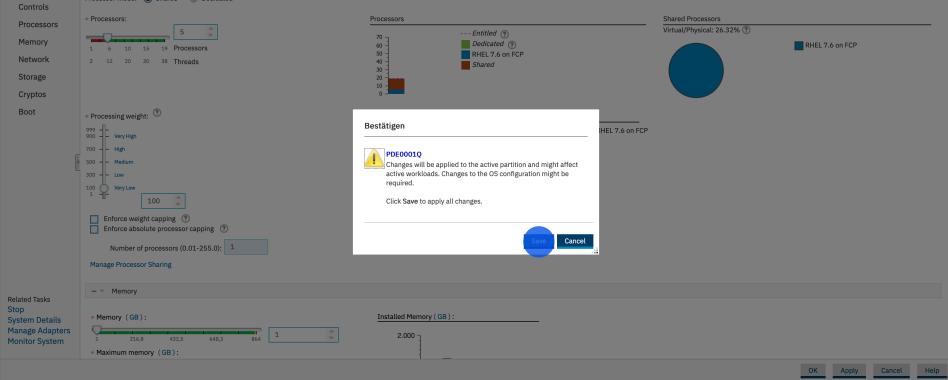


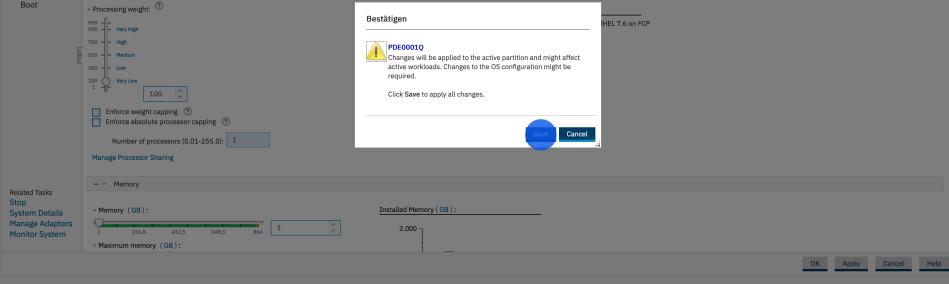


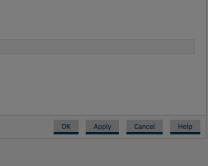








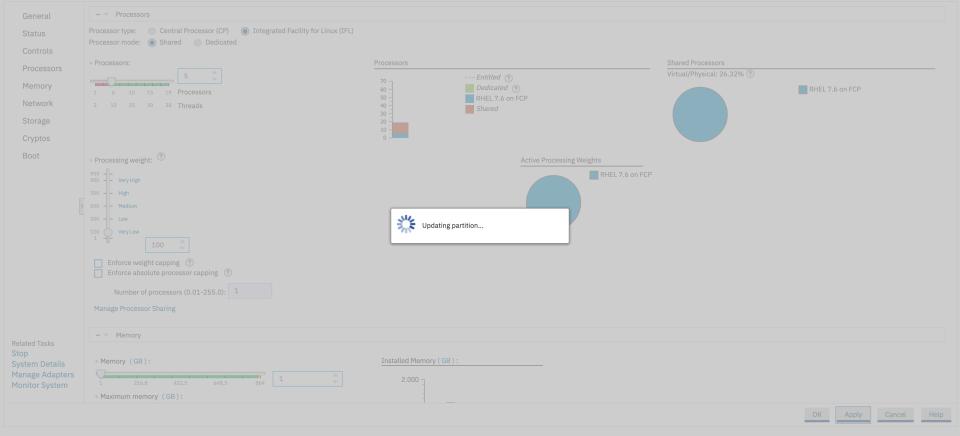






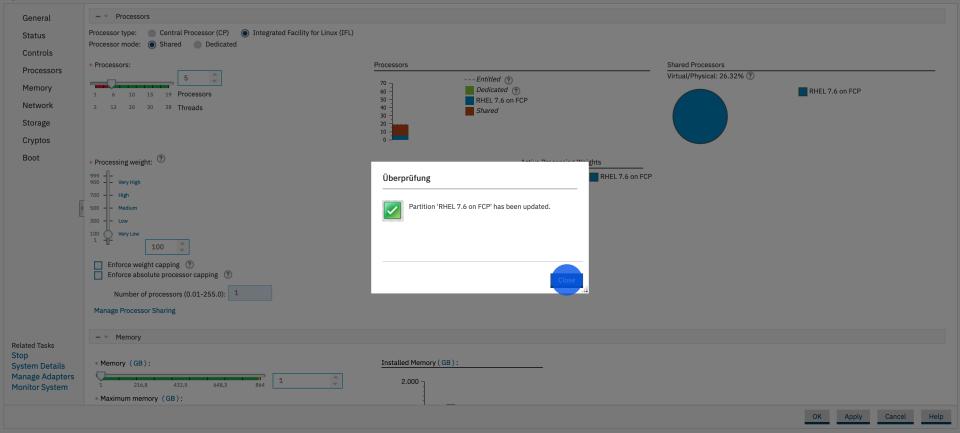
Home ▼ Configure Storage - P000T2... × Partition Details - RHEL 7... 🖒 ×

Partition Details - RHEL 7.6 on FCP

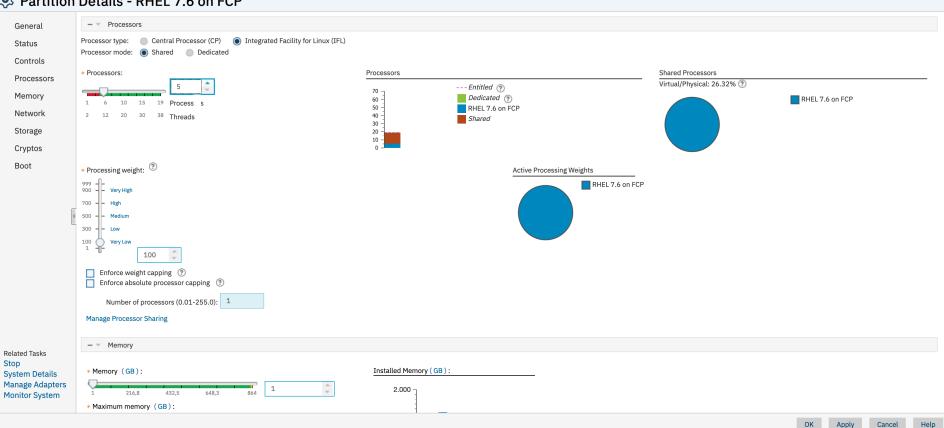




Partition Details - RHEL 7.6 on FCP







```
File
    Font
         Help
                      12
Core(s) per socket:
Socket(s) per book:
Book(s) per drawer:
                      5
Drawer(s):
NUMA node(s):
Vendor ID:
                      IBM/S390
Machine type:
                      8562
CPU dynamic MHz:
                      4500
CPU static MHz:
                      4500
BogoMIPS:
                      18656.00
Hypervisor:
                      PR/SM
Hypervisor vendor:
                      IBM
Virtualization type: full
Dispatching mode:
                      horizontal
Lld cache:
                      128K
Lli cache:
                      128K
L2d cache:
                      4096K
L2i cache:
                      4096K
                      262144K
L3 cache:
L4 cache:
                      983040K
NUMA node0 CPU(s):
                      0 - 7
                      esan3 zarch stfle msa ldisp eimm dfp edat etf3eh highgprs t
Flags:
e vx vxd vxe gs vxe2 vxp sort dflt sie
[root@rhel81 ~]#
```

```
File
    Font
         Help
                      12
Core(s) per socket:
Socket(s) per book:
Book(s) per drawer:
                      5
Drawer(s):
NUMA node(s):
Vendor ID:
                      IBM/S390
Machine type:
                      8562
CPU dynamic MHz:
                      4500
CPU static MHz:
                      4500
BogoMIPS:
                      18656.00
Hypervisor:
                      PR/SM
Hypervisor vendor:
                      IBM
Virtualization type: full
Dispatching mode:
                      horizontal
Lld cache:
                      128K
Lli cache:
                      128K
L2d cache:
                      4096K
L2i cache:
                      4096K
                      262144K
L3 cache:
L4 cache:
                      983040K
NUMA node0 CPU(s):
                      0 - 7
                      esan3 zarch stfle msa ldisp eimm dfp edat etf3eh highgprs t
Flags:
e vx vxd vxe gs vxe2 vxp sort dflt sie
[root@rhel81 ~]# lscpu
                          more
```

```
File
    Font
         Help
Architecture:
                       s390x
CPU op-mode(s):
                       32-bit, 64-bit
                       Big Endian
Byte Order:
CPU(s):
                        10
On-line CPU(s) list:
                        0 - 7
Off-line CPU(s) list: 8,9
Thread(s) per core:
                        12
Core(s) per socket:
Socket(s) per book:
Book(s) per drawer:
Drawer(s):
NUMA node(s):
Vendor ID:
                       IBM/S390
Machine type:
                       8562
CPU dynamic MHz:
                       4500
CPU static MHz:
                       4500
BogoMIPS:
                       18656.00
Hypervisor:
                       PR/SM
Hypervisor vendor:
                       IBM
Virtualization type:
                       full
Dispatching mode:
                       horizontal
L1d cache:
                       128K
Lli cache:
                       128K
--More--
```

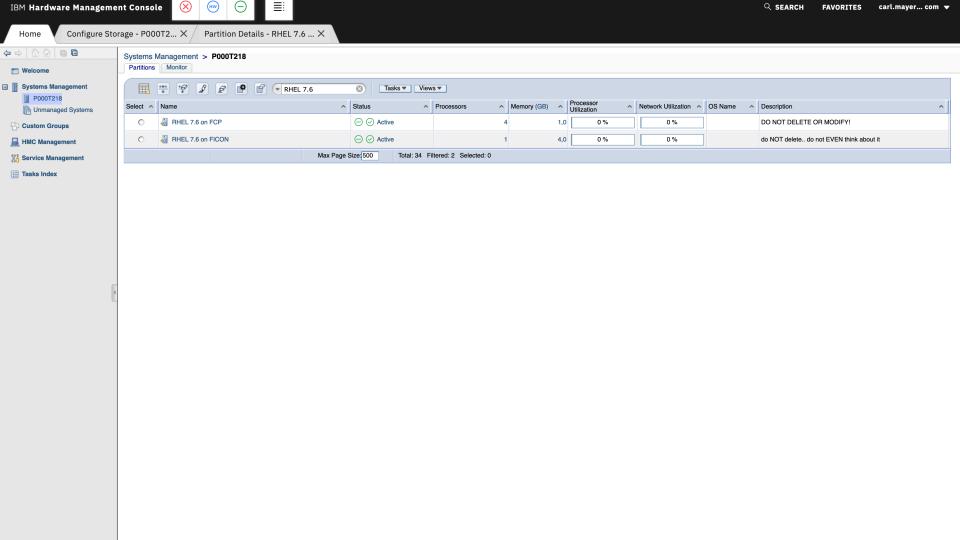
```
File
    Font
         Help
                       12
Core(s) per socket:
Socket(s) per book:
Book(s) per drawer:
Drawer(s):
NUMA node(s):
Vendor ID:
                       IBM/S390
Machine type:
                       8562
CPU dynamic MHz:
                       4500
CPU static MHz:
                       4500
BogoMIPS:
                       18656.00
Hypervisor:
                       PR/SM
Hypervisor vendor:
                       IBM
Virtualization type:
                       full
Dispatching mode:
                       horizontal
Lld cache:
                       128K
Lli cache:
                       128K
L2d cache:
                       4096K
L2i cache:
                       4096K
                       262144K
L3 cache:
L4 cache:
                       983040K
NUMA node0 CPU(s):
                       0 - 7
                       esan3 zarch stfle msa ldisp eimm dfp edat etf3eh highgprs
Flags:
te vx vxd vxe qs vxe2 vxp sort dflt sie
[root@rhel81 ~]# chcpu -c 8,9
```

```
File
    Font
         Help
Drawer(s):
NUMA node(s):
Vendor ID:
                       IBM/S390
Machine type:
                       8562
CPU dynamic MHz:
                       4500
CPU static MHz:
                       4500
                       18656.00
BogoMIPS:
Hypervisor:
                       PR/SM
Hypervisor vendor:
                       IBM
Virtualization type:
                       full
Dispatching mode:
                       horizontal
Lld cache:
                       128K
Lli cache:
                       128K
L2d cache:
                       4096K
L2i cache:
                       4096K
L3 cache:
                       262144K
L4 cache:
                       983040K
                       0 - 7
NUMA node0 CPU(s):
Flags:
                       esan3 zarch stfle msa ldisp eimm dfp edat etf3eh highgprs
te vx vxd vxe gs vxe2 vxp sort dflt sie
[root@rhel81 ~]# chcpu -c 8,9
CPU 8 configured
CPU 9 is already configured
[root@rhel81 ~]#
```

```
File
    Font
         Help
Drawer(s):
NUMA node(s):
Vendor ID:
                       IBM/S390
Machine type:
                       8562
CPU dynamic MHz:
                       4500
CPU static MHz:
                       4500
                       18656.00
BogoMIPS:
Hypervisor:
                       PR/SM
Hypervisor vendor:
                       IBM
                       full
Virtualization type:
Dispatching mode:
                       horizontal
Lld cache:
                       128K
Lli cache:
                       128K
L2d cache:
                       4096K
L2i cache:
                       4096K
L3 cache:
                       262144K
L4 cache:
                       983040K
                       0 - 7
NUMA node0 CPU(s):
Flags:
                       esan3 zarch stfle msa ldisp eimm dfp edat etf3eh highgprs
te vx vxd vxe gs vxe2 vxp sort dflt sie
[root@rhel81 ~]# chcpu -c 8,9
CPU 8 configured
CPU 9 is already configured
[root@rhel81 ~]# chcpu -e 8,9
```

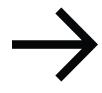
```
File
    Font
         Help
                       8562
Machine type:
CPU dynamic MHz:
                       4500
CPU static MHz:
                       4500
BogoMIPS:
                       18656.00
                       PR/SM
Hypervisor:
Hypervisor vendor:
                       IBM
Virtualization type:
                       full
Dispatching mode:
                       horizontal
Lld cache:
                       128K
Lli cache:
                       128K
L2d cache:
                       4096K
L2i cache:
                       4096K
L3 cache:
                       262144K
L4 cache:
                       983040K
NUMA node0 CPU(s):
                       0 - 7
                       esan3 zarch stfle msa ldisp eimm dfp edat etf3eh highgprs
Flags:
te vx vxd vxe qs vxe2 vxp sort dflt sie
[root@rhel81 ~]# chcpu -c 8,9
CPU 8 configured
CPU 9 is already configured
[root@rhel81 ~]# chcpu -e 8,9
CPU 8 enabled
CPU 9 enabled
[root@rhel81 ~]#
```

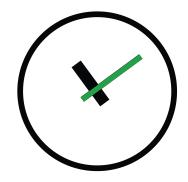
```
File
    Font
         Help
Architecture:
                      s390x
CPU op-mode(s):
                      32-bit, 64-bit
                      Big Endian
Byte Order:
CPU(s):
                      10
On-line CPU(s) list: 0-9
Thread(s) per core:
Core(s) per socket:
Socket(s) per book:
Book(s) per drawer:
Drawer(s):
                      5
NUMA node(s):
Vendor ID:
                      IBM/S390
Machine type:
                      8562
CPU dynamic MHz:
                      4500
CPU static MHz:
                      4500
BogoMIPS:
                      18656.00
Hypervisor:
                      PR/SM
Hypervisor vendor:
                      IBM
Virtualization type: full
                      horizontal
Dispatching mode:
Lld cache:
                      128K
Lli cache:
                      128K
L2d cache:
                      4096K
--More--
```



Demo [End]

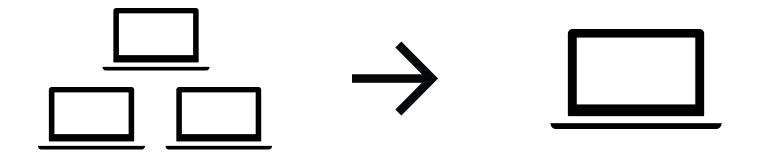






Days

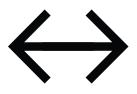
Minutes



Several management endpoints

Single management endpoint







System Administrator

Storage Administrator

APIs?

HMC Web Services APIs





GitHub

zhmcclient/python-zhmcclient

A pure Python client library for the IBM Z HMC Web Services API.



GitHub

zhmcclient/zhmccli

A CLI for the IBM Z HMC, written in pure Python.



GitHub

zhmc-ansible-modules

Ansible modules for the IBM Z HMC Web Services API.

LinuxONE + DPM =

What's next?

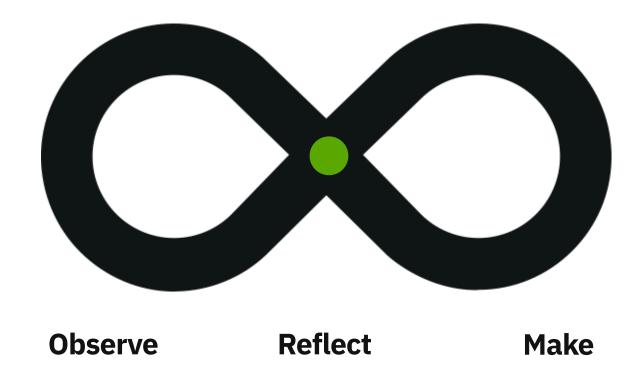
NVMe

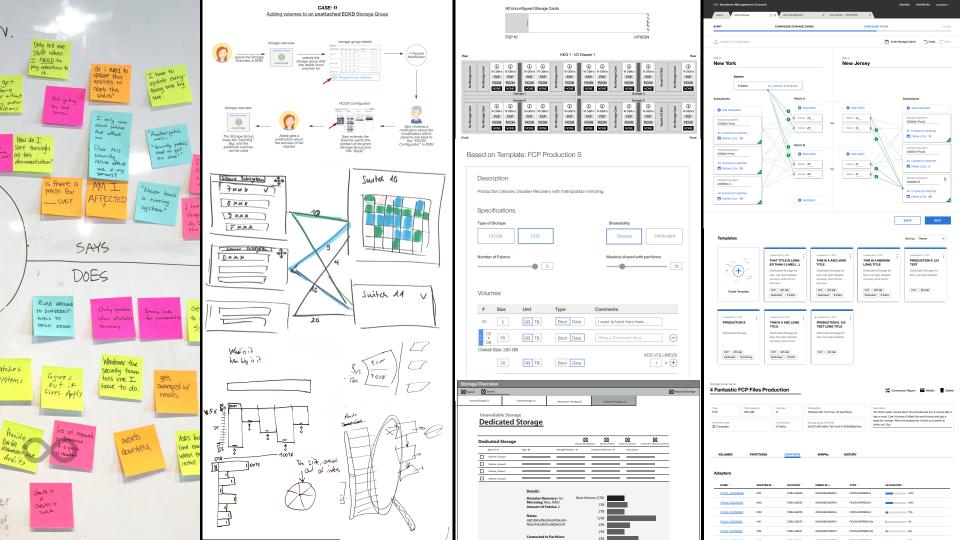
New storage standard devices integrated into our hardware platform to enable or optimise new workloads.



Sponsor User Program

The Loop





A shift from an engineering-centric to an human-centric approach.

Q & A

Stay safe and healthy @ Home!

Thank you

Carl Mayer IBM Senior Technical Staff Member

carl@de.ibm.com +49-7031-16-2796 ibm.com

© Copyright IBM Corporation 2019. All rights reserved. The information contained in these materials is provided for informational purposes only, and is provided AS IS without warranty of any kind, express or implied. Any statement of direction represents IBM's current intent, is subject to change or withdrawal, and represent only goals and objectives. IBM, the IBM logo, and ibm.com are trademarks of IBM Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available at Copyright and trademark information.

Backup

Technical Specifications

IBM z15 and IBM LinuxONE III,

IBM z13, z13s, z14 including ZR1, IBM LinuxONE Emperor, IBM LinuxONE Rockhopper, and z14 LR1

Feature Code #0016: Hardware Requirements for IBM DPM

Two dedicated OSA-Express6S 1000BASE-T Ethernet (#0426) or OSA-Express5S 1000BASE-T Ethernet (#0417)

Supported I/O Adapters

FICON Express 8S/16S/16S+ (Type FCP and FC)
FICON Express 16SE and FCP32
OSA-Express5S/6S and OSA-Express7S 1/10/25Gb
Crypto Express5S/6S and Crypto Express7S
RoCE Express and RoCE Express2 10/25GbE
HiperSockets

Supported Operating Environments

Linux for IBM Z KVM for IBM Z z/VM support for FCP and FICON (z/VM 6.4 and newer)

IBM Secure Service Container

Support for auto-configuration of devices to simplify Linux installation, where Linux distribution installers exploit function*

No support yet for

z/OS, z/VSE, z/TPF GDPS* Virtual Appliance FICON CTC FICON Tape

^{*}IBM is working with the open source community and with the Linux distribution partners to get the functionality included in Linux on Z.

Trademarks

The following are trademarks of the International Business Machines Corporation in the United States and/or other countries.

BladeCenter*	DFSMShsm	HiperSockets	Ibm.com	LinuxONE Emperor	z13*	z/OS*
CICS*	ECKD	HyperSwap*	IBMZ*	PR/SM	z14	z/VM*
DB2*	FICON*	IBM*	InfiniBand*	System Storage*	zEnterprise*	z/VSE*
DESMSdss	GDPS*	IBM (logo)*	LinuxONE	WebSphere*	zHyperLink	

^{*} Registered trademarks of IBM Corporation

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.

IT Infrastructure Library is a Registered Trade Mark of AXELOS Limited.

ITIL is a Registered Trade Mark of AXELOS Limited.

Linear Tape-Open, LTO, the LTO Logo, Ultrium, and the Ultrium logo are trademarks of HP, IBM Corp. and Quantum in the U.S. and other countries.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc. in the United States, other countries, or both and is used under license therefrom.

UNIX is a registered trademark of The Open Group in the United States and other countries.

VMware, the VMware logo, VMware Cloud Foundation, VMware Cloud Foundation Service, VMware vCenter Server, and VMware vSphere are registered trademarks or trademarks of VMware, Inc. or its subsidiaries in the United States and/or other jurisdictions.

Other product and service names might be trademarks of IBM or other companies.

Notes:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the performance, compatibility, or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Prices subject to change without notice. Contact your IBM representative or Business Partner for the most current pricing in your geography.

This information provides only general descriptions of the types and portions of workloads that are eligible for execution on Specialty Engines (e.g., zIIPs, zAAPs, and IFLs) ("SEs"). IBM authorizes customers to use IBM SE only to execute the processing of Eligible Workloads of specific Programs expressly authorized by IBM as specified in the "Authorized Use Table for IBM Machines" provided at www.ibm.com/systems/support/machine_warranties/machine_code/aut.html ("AUT"). No other workload processing is authorized for execution on an SE. IBM offers SE at a lower price than General Processors/Central Processors because customers are authorized to use SEs only to process certain types and/or amounts of workloads as specified by IBM in the AUT.

