

# Using Virtualization to Help Move a Data Center

Jim Moling  
US Treasury, Financial Management Service

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**SHARE** in Boston

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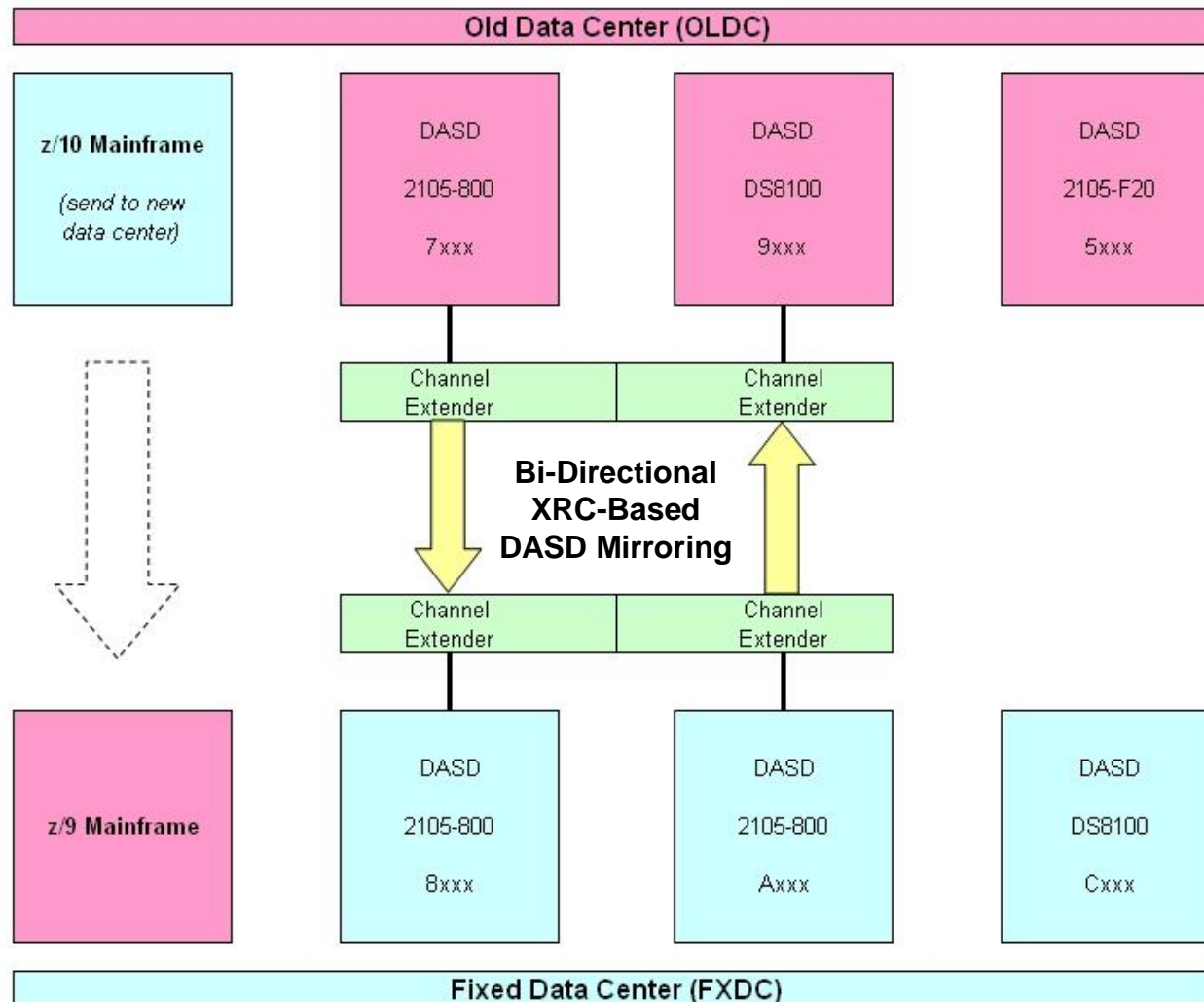
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## Overview

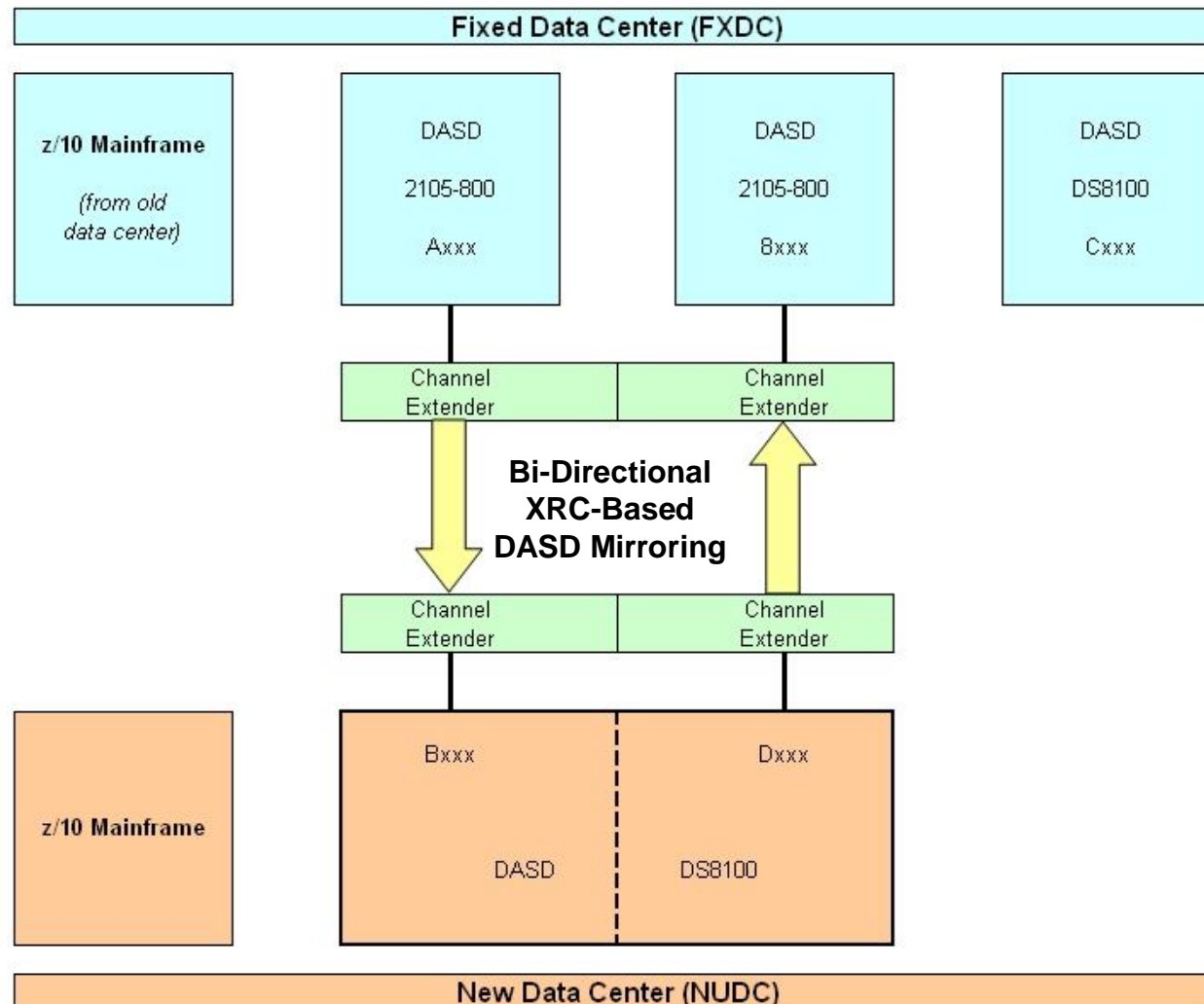
This presentation will discuss the following aspects in moving mainframe-based workloads to a new data center:

- How z/VM was used to create a virtual data center environment
- How TCP/IP was employed to create the virtual IP infrastructure
- How XRC-based DASD mirroring was used to duplicate & synchronize data

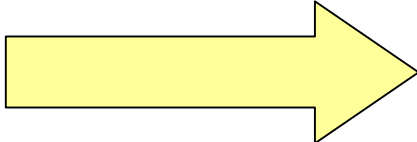
# Original Data Center Configuration

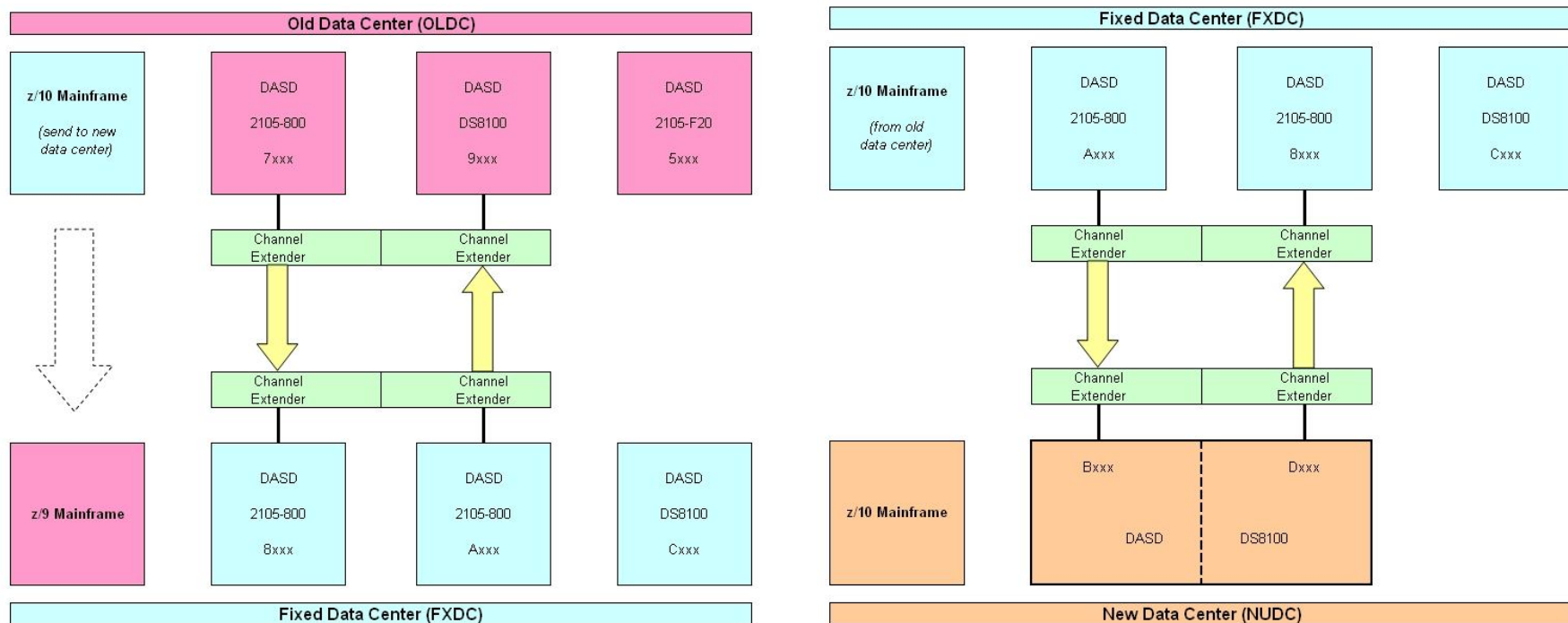


# New Data Center Configuration



# How to get from here to there?

**Here**  **There?**



## How to get from here to there?

1. Install new DS8100 DASD box at old data center
2. Setup an XRC SDM system using volumes in the new DS8100
3. Copy data from old DASD boxes using the XRC Migrate function
4. Setup VM environments for the new virtual data center under existing VM environments at old data center
5. Define z/OS & Linux virtual machines to the new VM environments
6. Setup IP infrastructure for new data center – re-IP z/OS & Linux guests
7. Test access & functionality of the new virtual data center
8. Make the virtual data center available for end-user testing
9. Shutdown virtual data center environment and refreshed data using the XRC migrate function (excluding certain system volumes)
10. Disconnect the new DASD box and ship to the new data center
11. Connect the new DS8100 to the z10 in new data center & IPL systems
12. Establish XRC session back to old data center & re-sync data
13. Cutover from old data center to new data center & shutdown old site

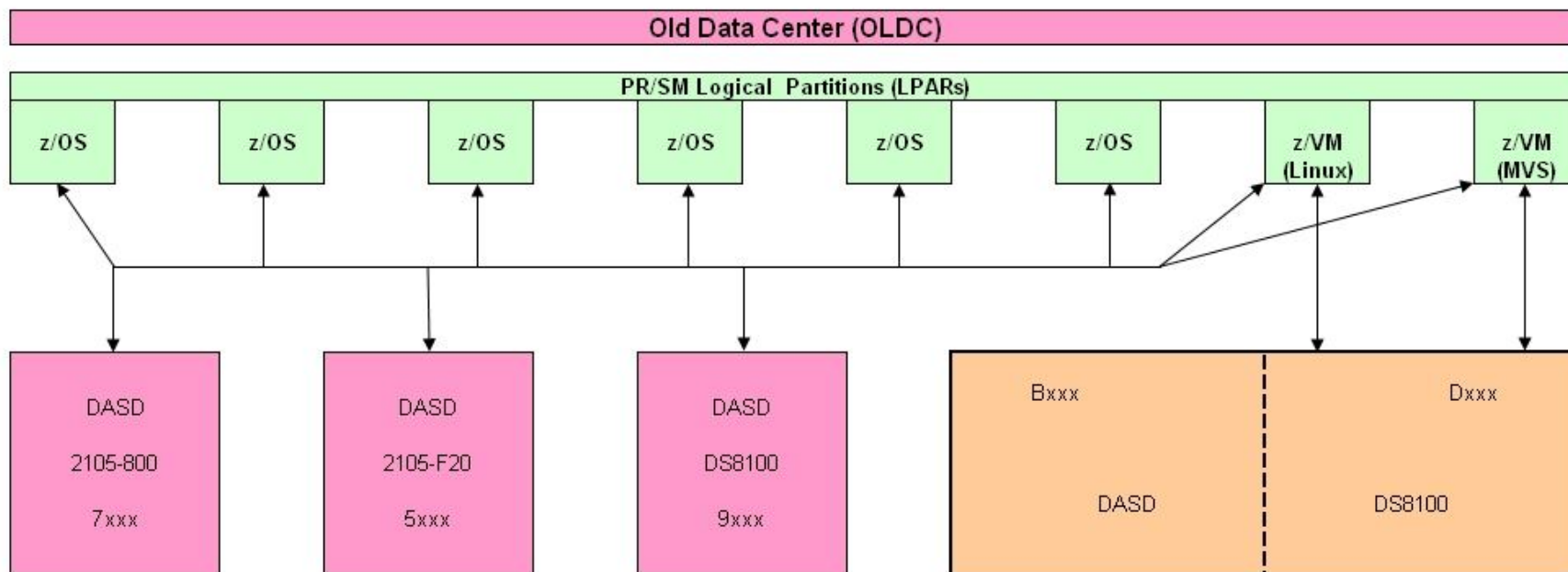
## XRC or Migrate – What’s the Difference?

- For normal Disaster Recovery (D/R) sessions, we specify:
  - SESSIONTYPE(XRC)
  - XRC specifies to operate in recovery mode, which means that Journal volumes are used to guarantee secondary volume consistency group time. It also uses Control and State data sets.
- For moving the data center, we specified:
  - SESSIONTYPE(MIGRATE)
  - MIGRATE specifies that the system data mover (SDM) updates the secondary volumes on a consistency group basis, but not write updates to the Journal data sets. Journal & State data sets are not used, and you must pre-allocate the XRC Control data sets.



# Install New DS8100 at Old Data Center

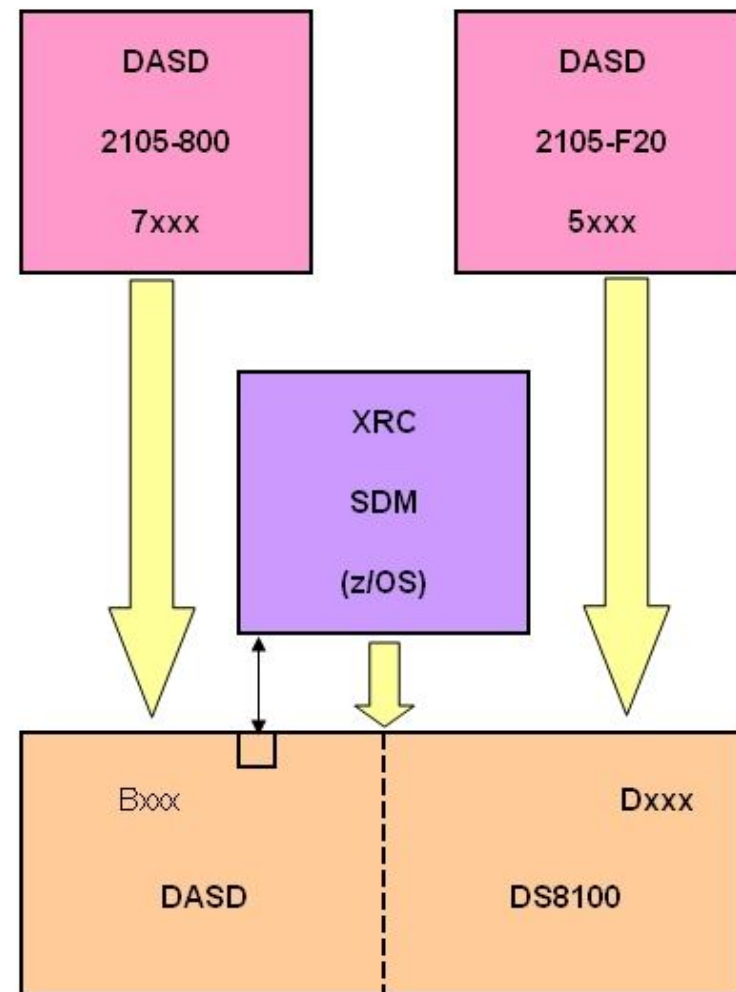
1. Install the new DS8100 DASD box at the old data center



Although we had a shared DASD environment (all LPARs see all DASD),  
only the z/VM LPARs are connected to the new DS8100 DASD box

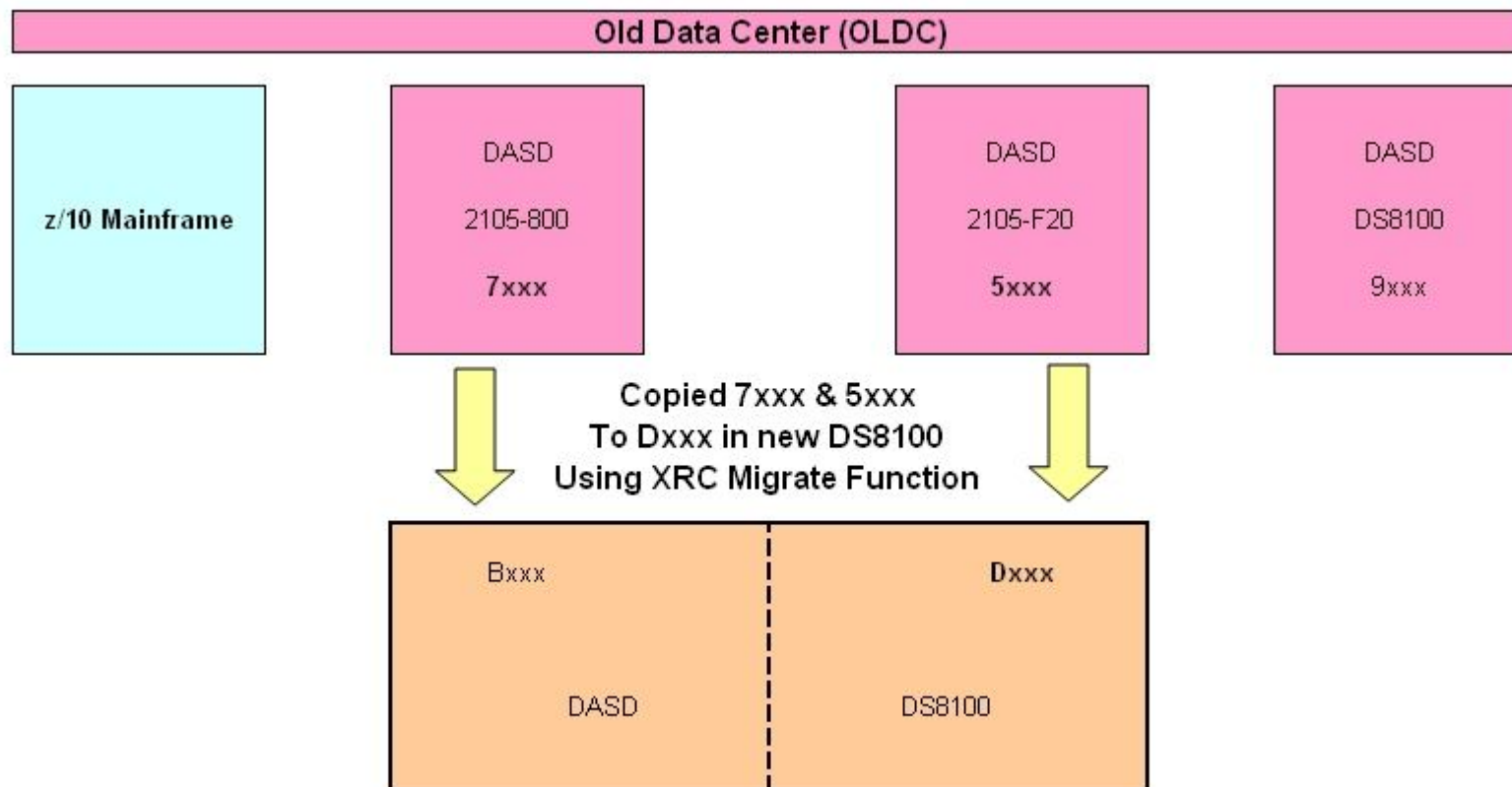
## Setup an XRC SDM system

2. Setup an XRC System Data Mover (SDM) system
  - The SDM runs in the z/OS environment
  - The system volumes for the SDM are allocated in the new DS8100



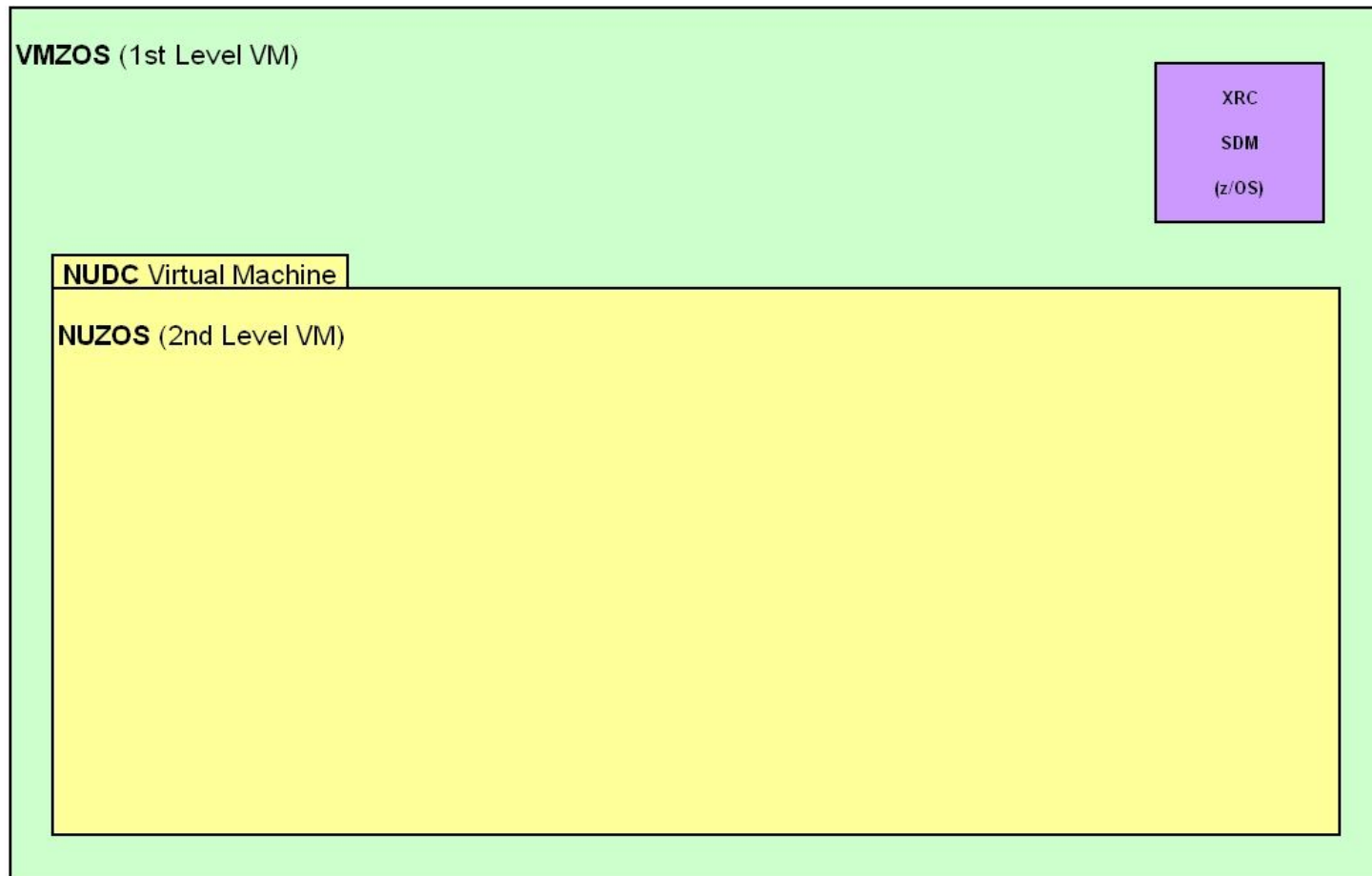
# Start an XRC Migrate Session

- XRC Migrate data from old DASD boxes to new DASD box using the new XRC SDM



# Setup VM for New Virtual Data Center

## 4. Define 2nd level VM for new z/OS environments



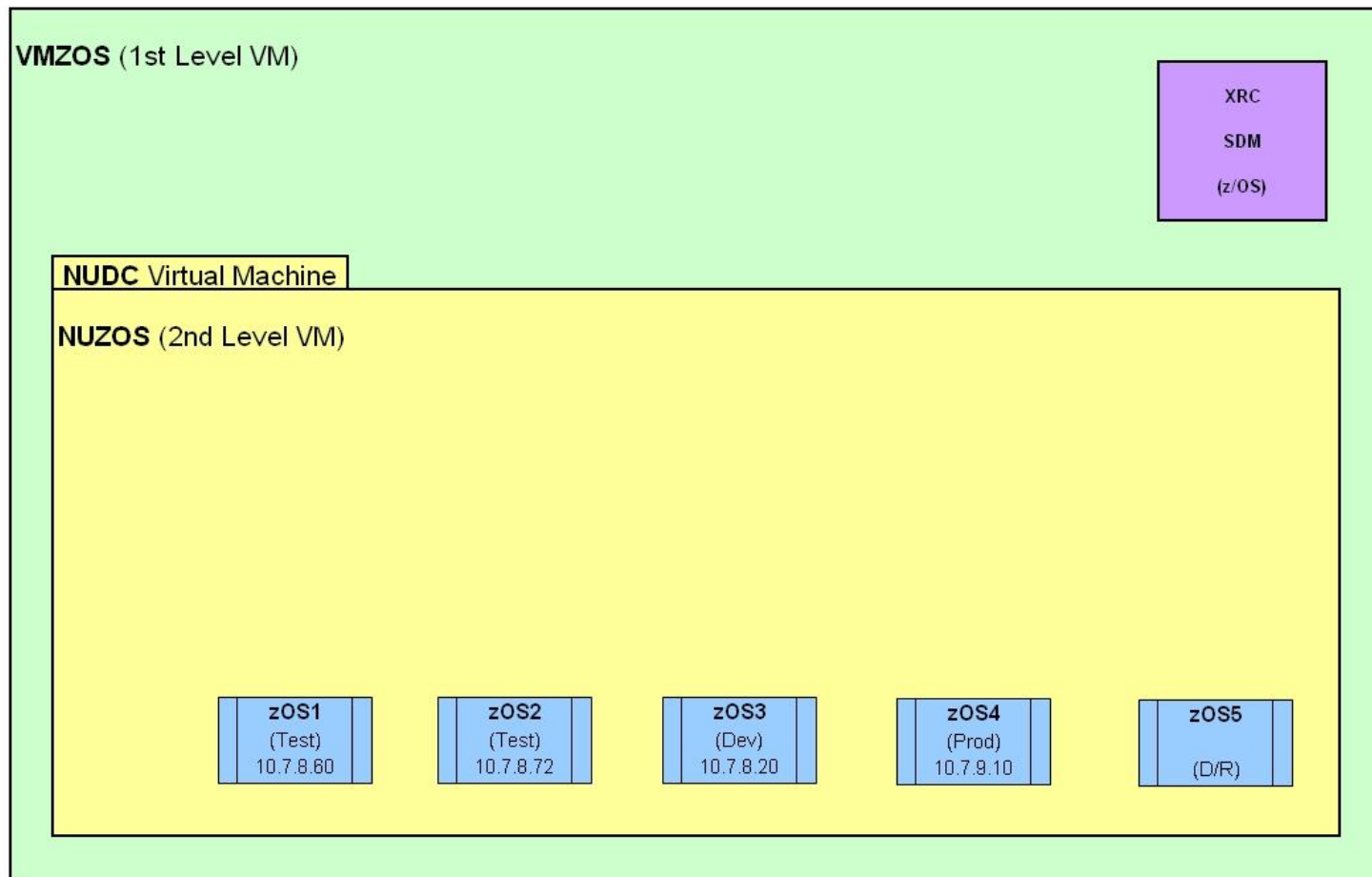
# Setup VM for New Virtual Data Center

4. Define 2nd level VM for new z/Linux environments



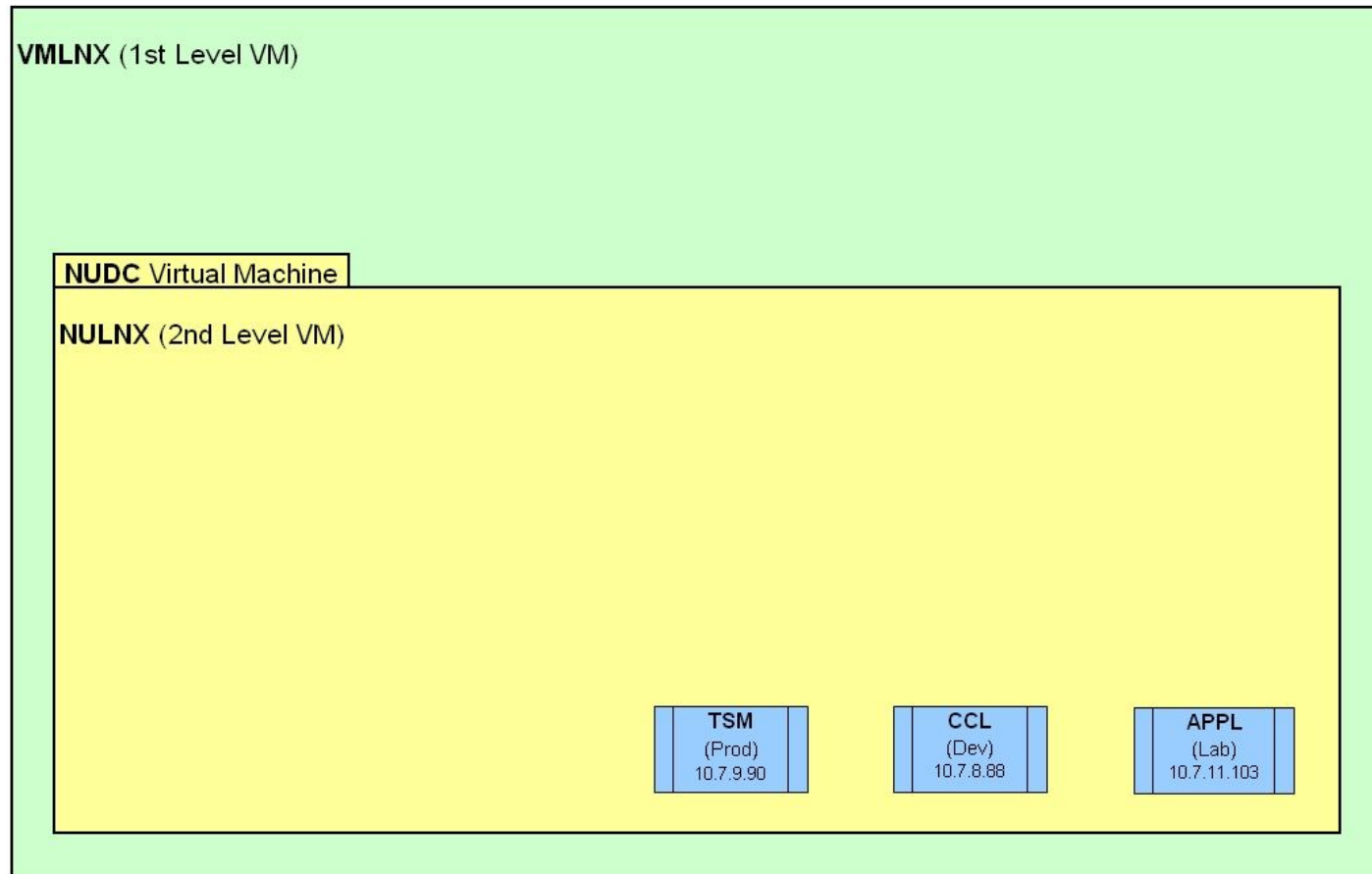
# Define z/OS & z/Linux Virtual Machines

## 5. Define new z/OS virtual machines under 2nd level VM



# Define z/OS & z/Linux Virtual Machines

5. Define new z/Linux virtual machines under 2nd level VM (copied 1<sup>st</sup> level)



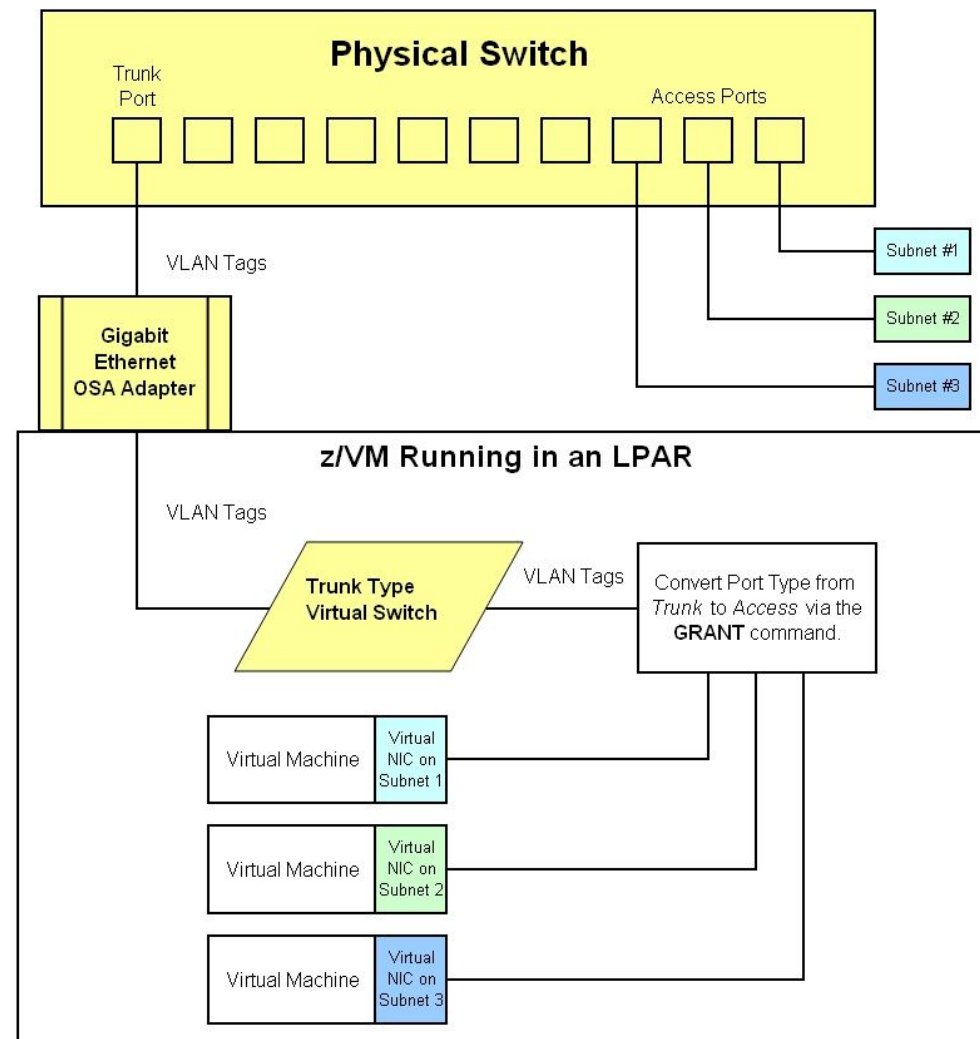
# IP Infrastructure – Using Trunk Port OSA

## 6. IP Infrastructure

**TCP/IP Issue:** Only had (1) OSA adapter available, but needed (3) subnets

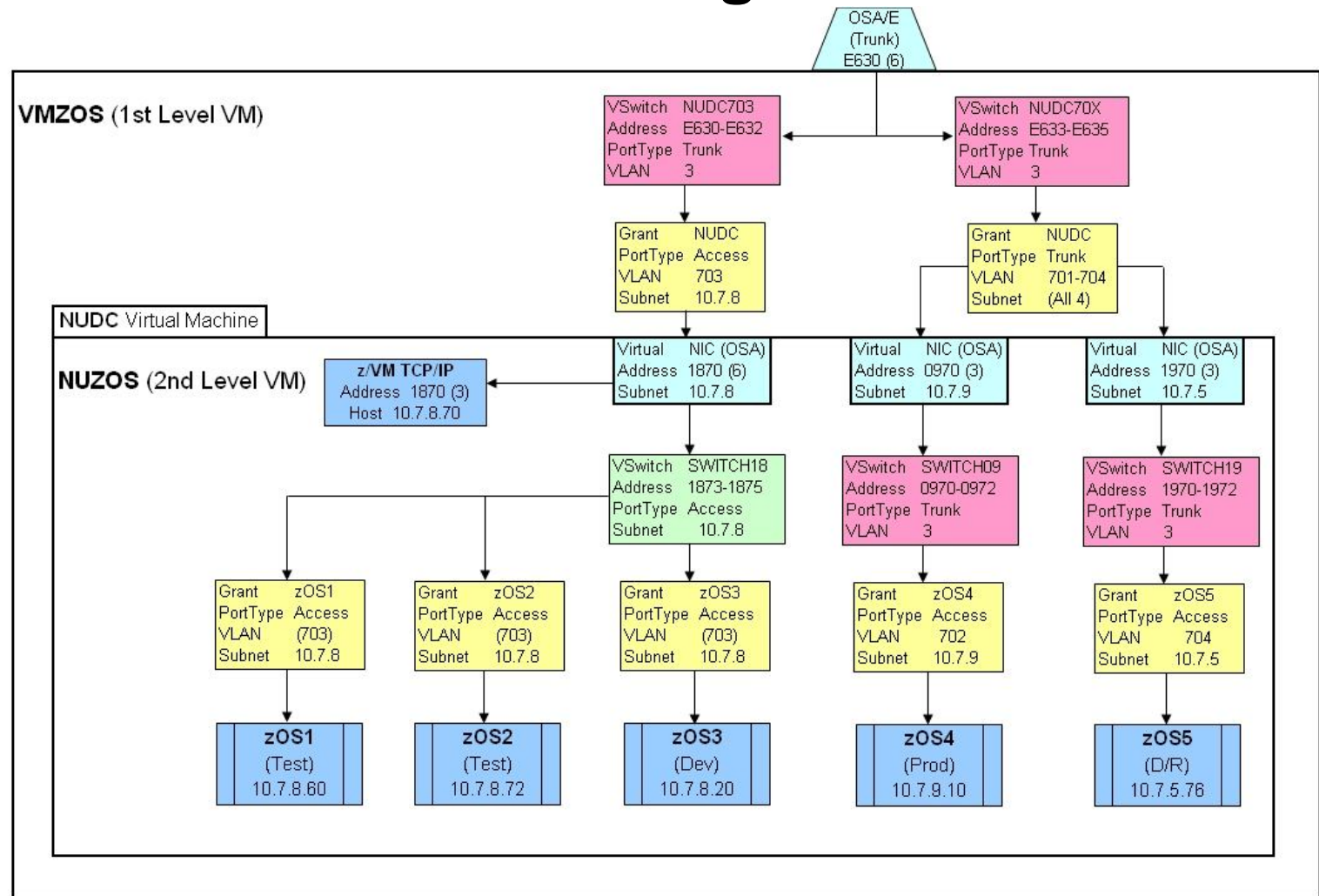
**Solution:** Used a trunk port with (3) VLANs from physical switch

Under z/VM, used Trunk Type Virtual Switches and made VLANs transparent to the virtual machines (that ran 2nd level VM) via the GRANT command

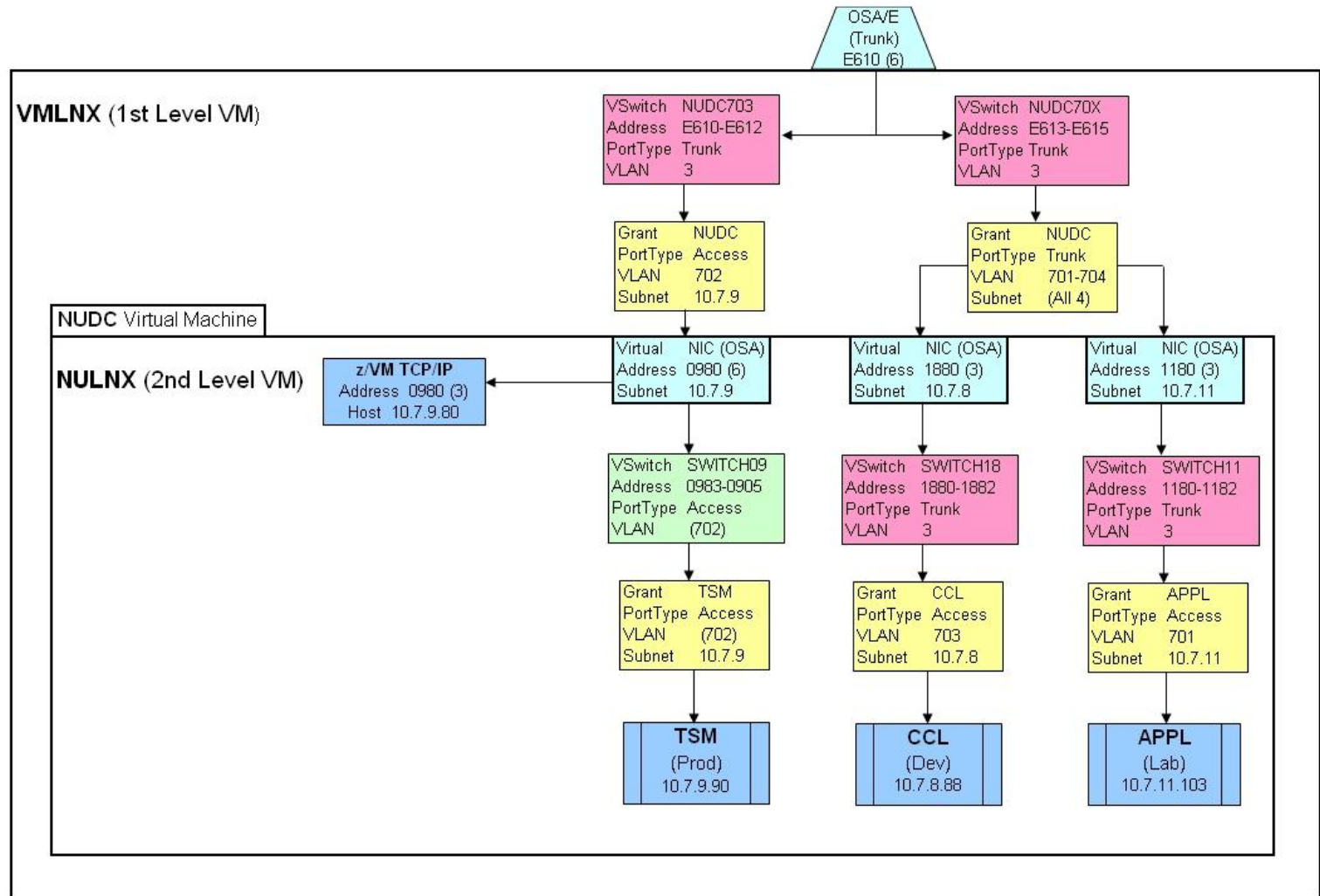




# Virtual IP Structure For Hosting z/OS

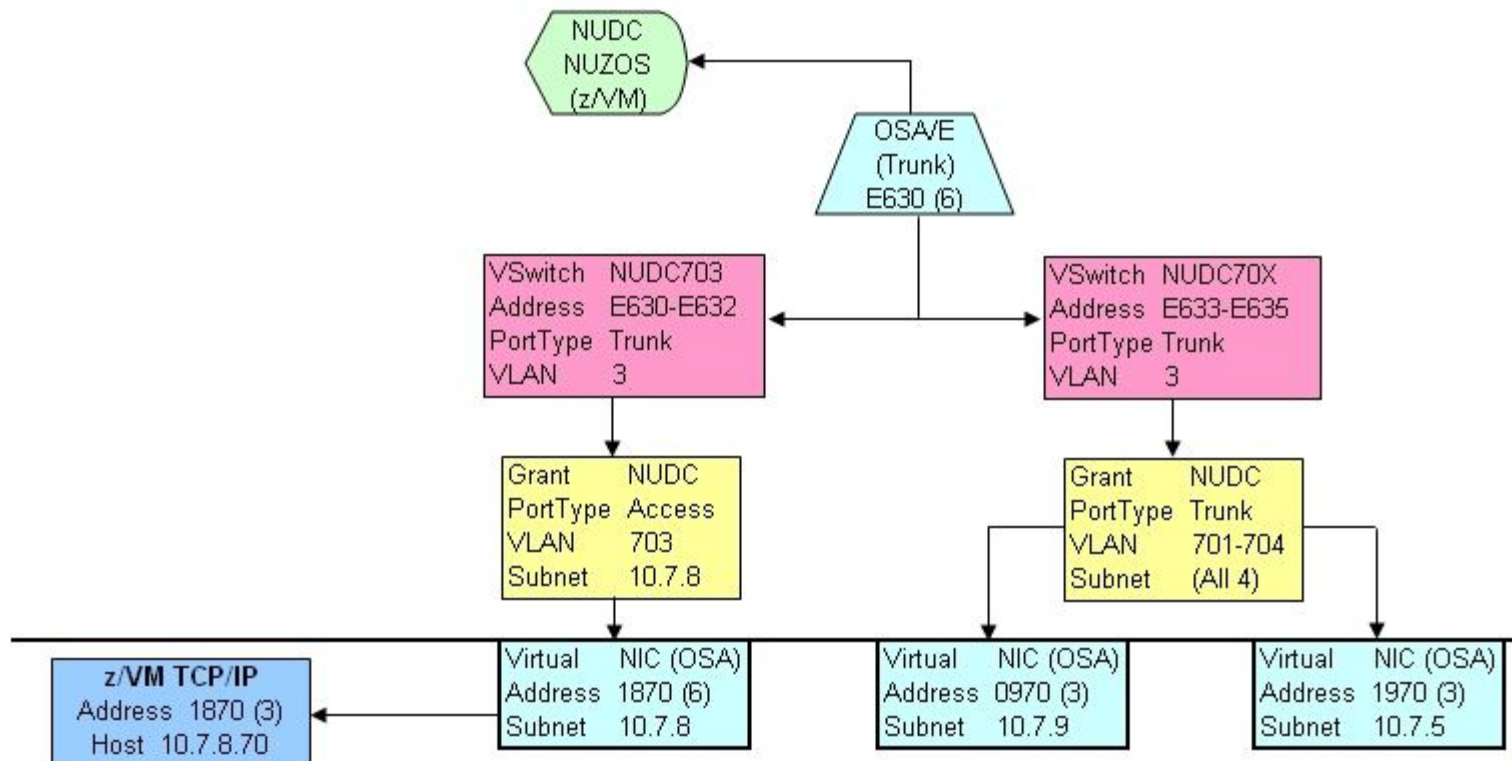


# Virtual IP Structure For Hosting z/Linux



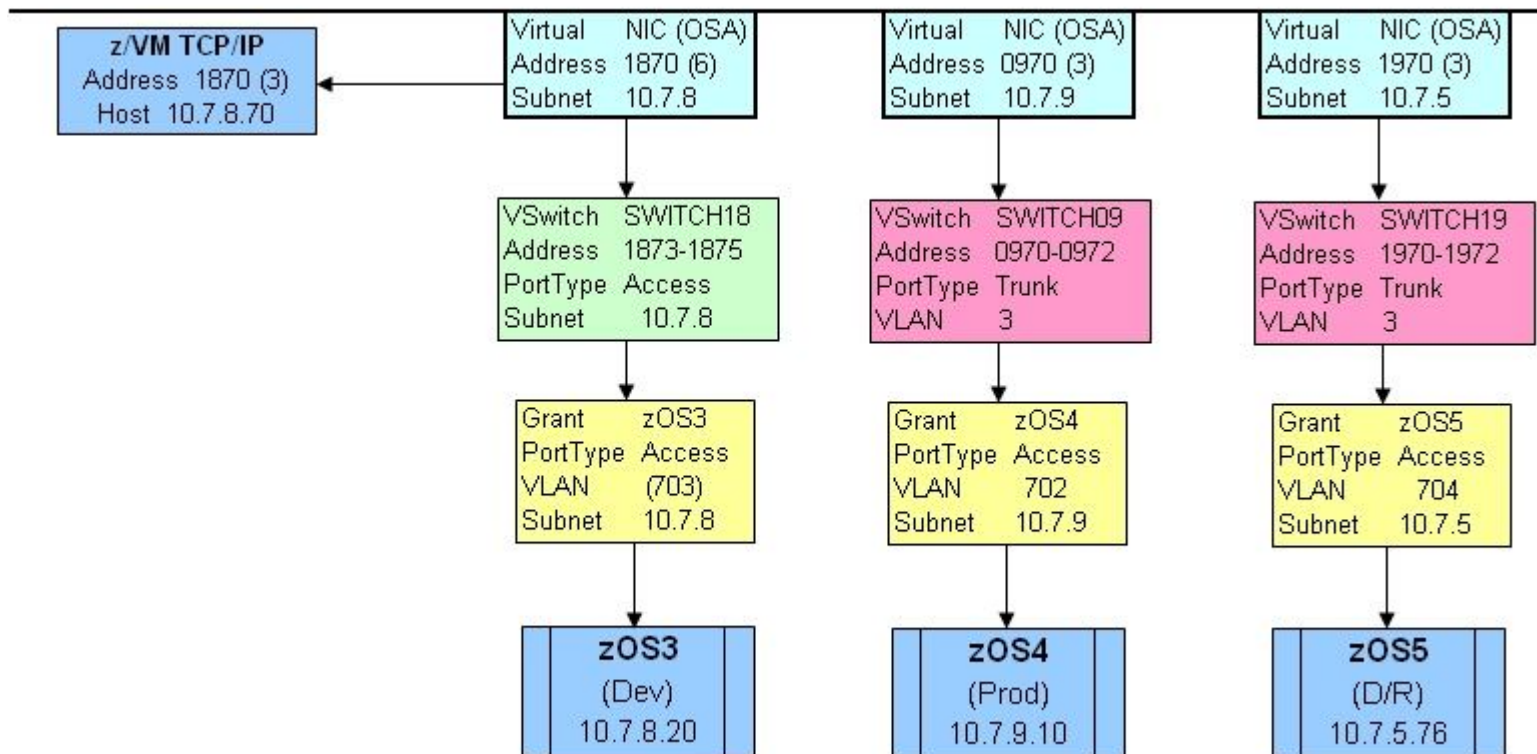
# Testing IP Connectivity

7. Tested IP Connectivity at the VM level first (10.7.8.70). Also made sure that all virtual NICs were available.



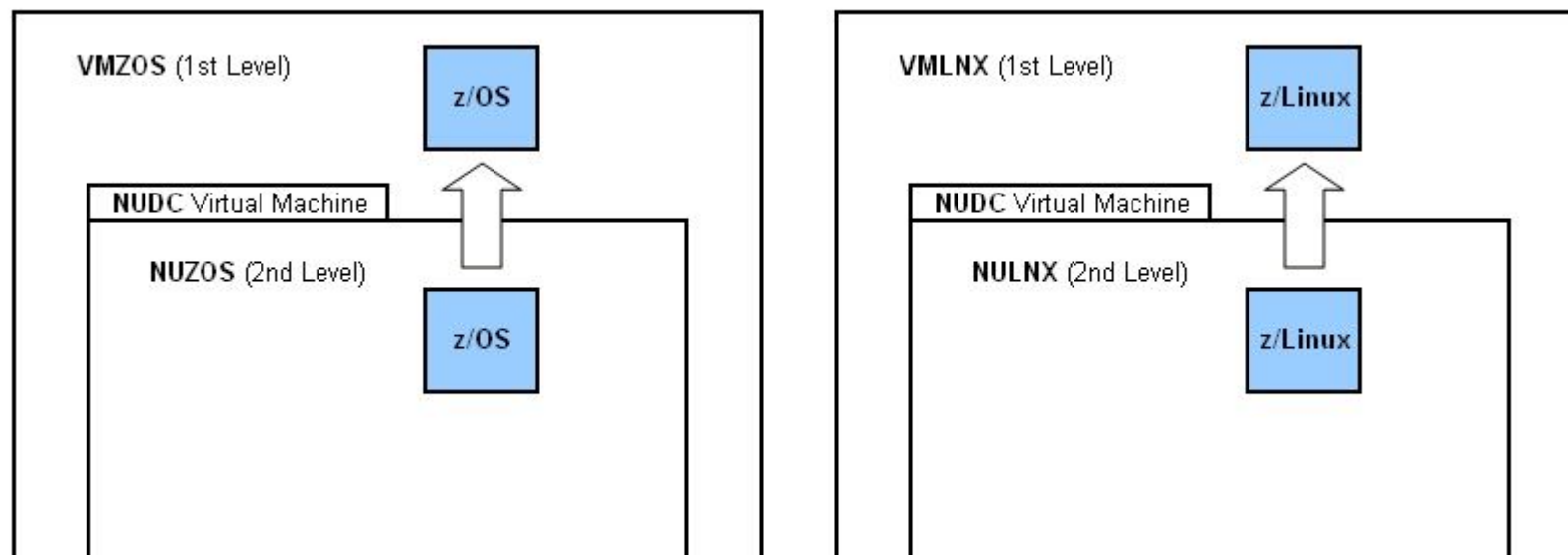
# Testing IP Connectivity

- Next, confirmed IP connectivity down to the z/OS virtual machine level (before IPLing z/OS)



## Ready to IPL z/OS & z/Linux Platforms

- Do we want to IPL z/OS & z/Linux from 2<sup>nd</sup> level VM? No!
- Why? Because they were VERY slow under 2<sup>nd</sup> level VM!
- We copied z/OS & z/Linux definitions to 1<sup>st</sup> level for testing

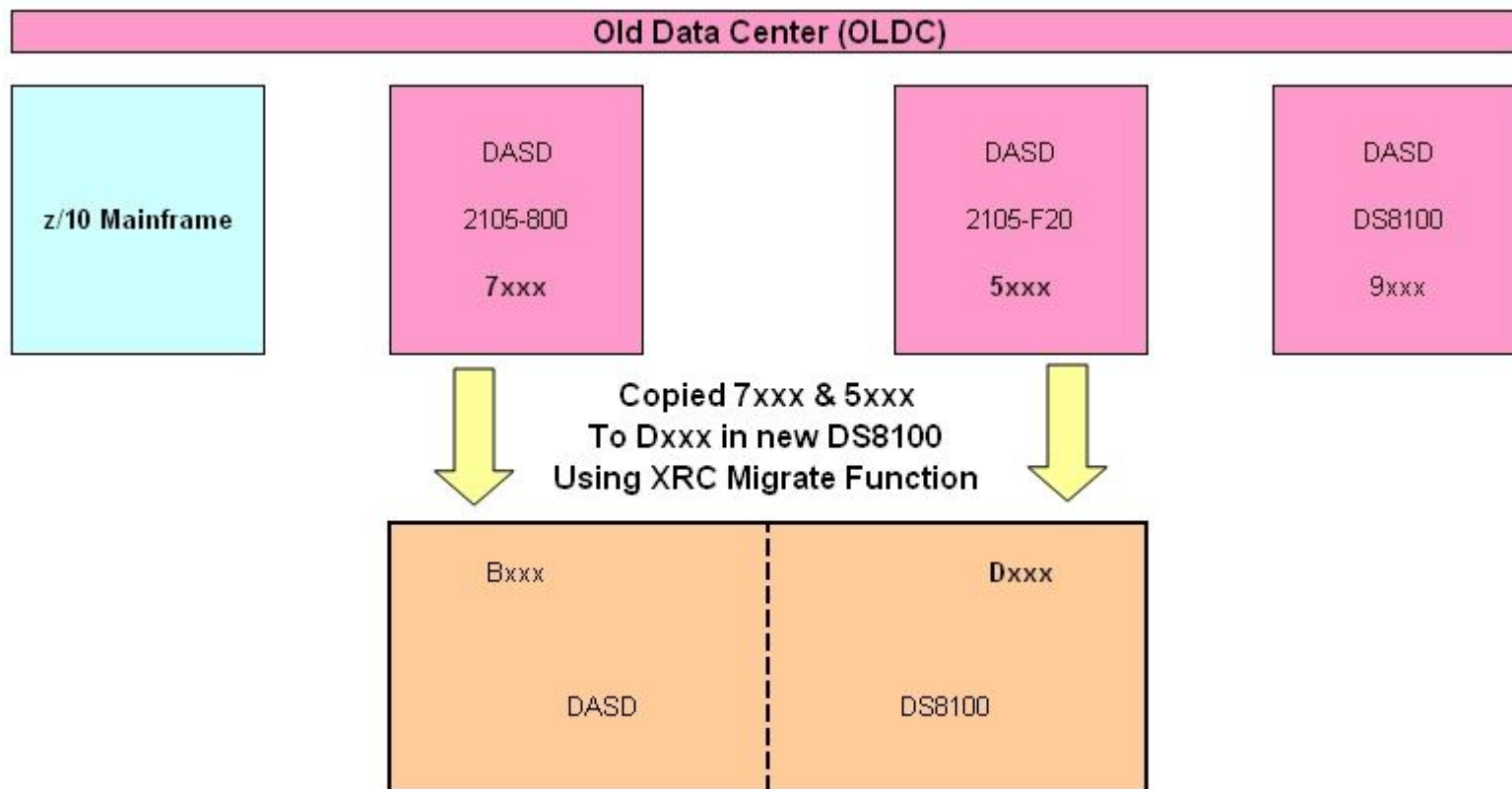


## Ready For End-User Test & Check-out

8. This was not meant to be high-volume testing, just enough to confirm that basic functions were accessible & working
9. Once the virtual data center environments were confirmed, the z/OS, z/Linux and z/VM environments that made up the virtual data center were shutdown
  - Started XRC Migrate session one more time before disconnecting the DS8100
  - Once all volumes were in duplex status, suspended the XRC Migrate session

# Performed XRC Migrate One Last Time

9. XRC Migrate data from old DASD boxes to new DS8100 box  
(system volumes used to run z/VM, z/OS & z/Linux were excluded)



## Shipped DS8100 to New Data Center

10. Disconnected the DS8100 from the old data center, boxed it up and shipped it to the new data center
11. Once the DS8100 arrived at the new data center, it was connected to the z10 mainframe
  - Once the I/O configuration was loaded into the z10 and it was configured with the LPARs needed, it was time to IPL



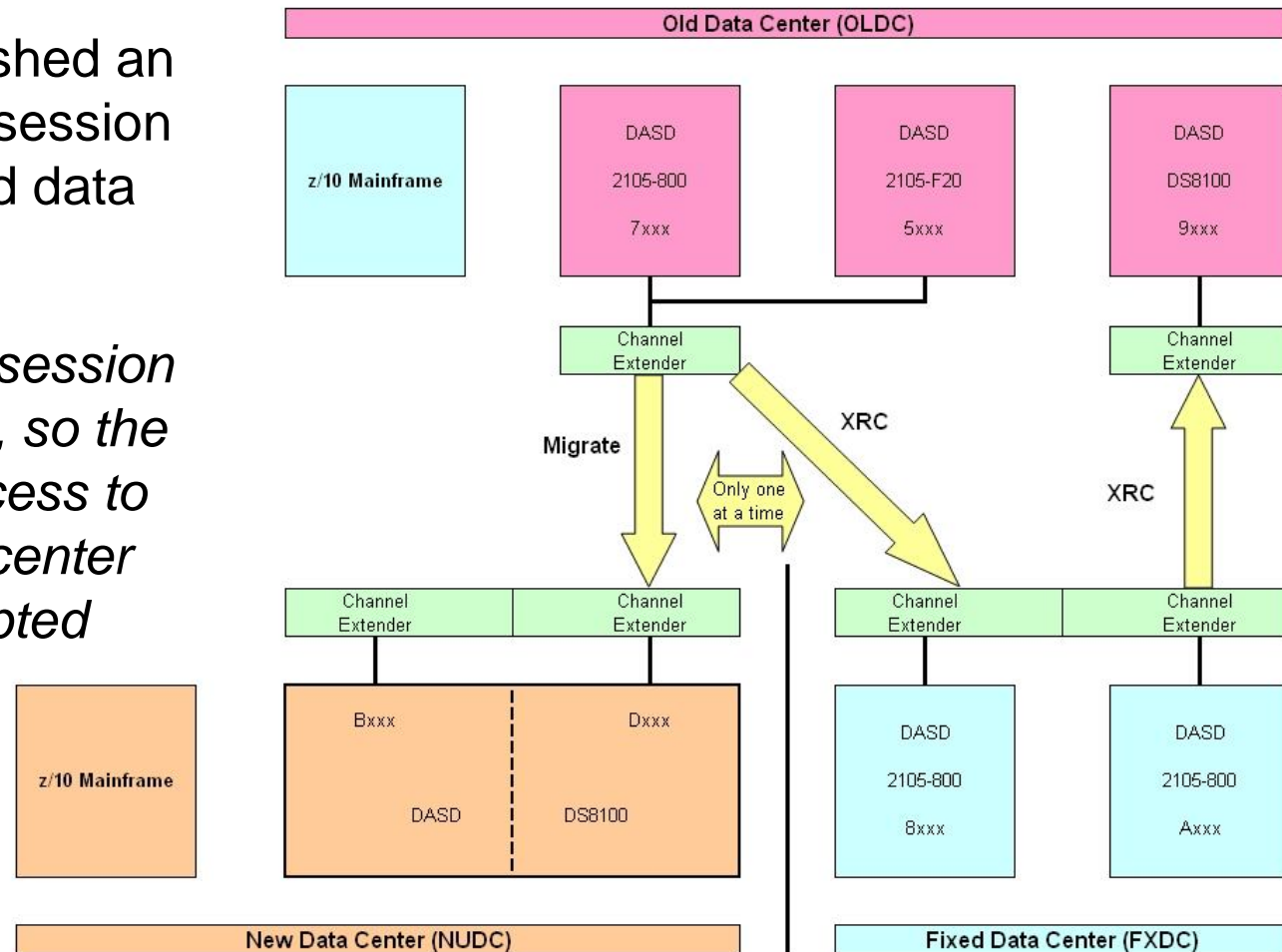
## Ready to IPL at the New Data Center

- z/VM systems were IPLed first, and they were successful
- We now had the option of running a z/OS system under z/VM, if needed
- Next, IPLed a z/OS system that normally runs under z/VM, which was successful
- We now had a z/OS environment that could be used for troubleshooting, if needed
- It was now time to IPL the z/OS systems that run natively in an LPAR – a total of 6 systems
- All 6 z/OS systems IPLed successfully the first time!

# Re-Establish XRC Migrate Session

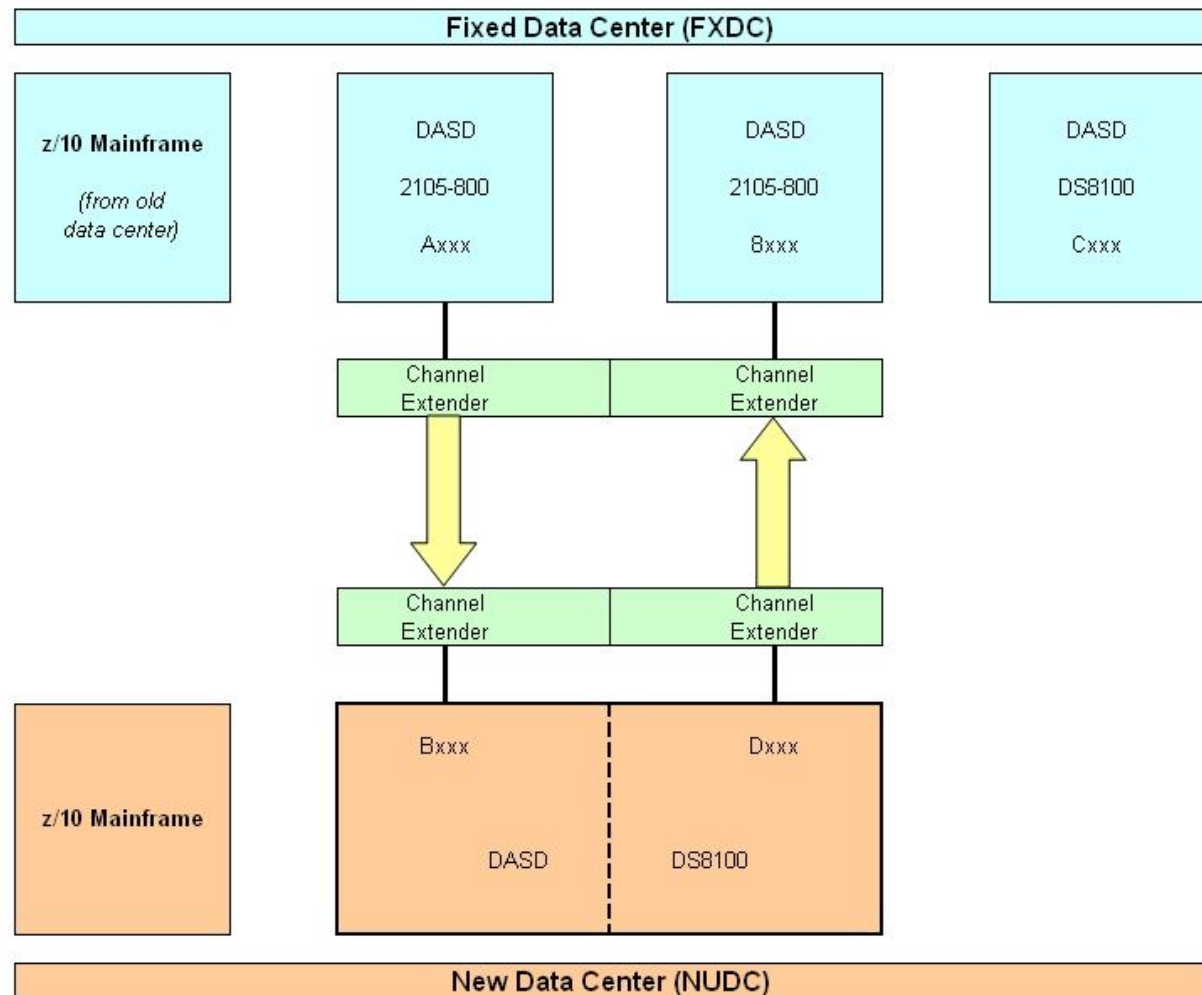
12. We re-established an XRC Migrate session back to the old data center

*However, only 1 session can run at a time, so the normal XRC process to the “Fixed” data center had to be interrupted*



# Final Cutover to New Data Center

- 13. Cutover to new data center on a weekend
  - Established bi-directional XRC DASD mirroring
  - Shutdown z10 in old data center & sent to “Fixed” data center



# Questions or Comments?

- Any Questions?
  - Any Comments?