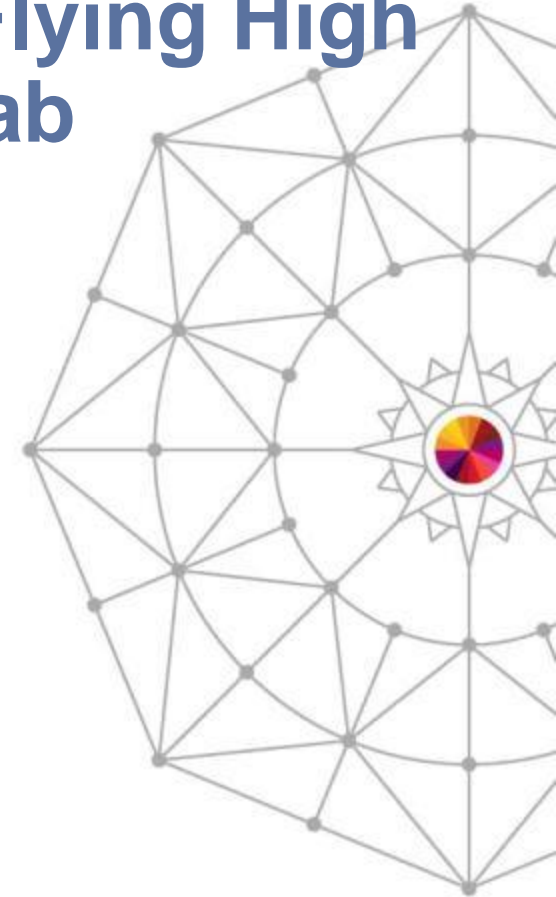


# zEC12 User Experience: Flying High on a Concrete Slab

J. O. Skip Robinson  
Southern California Edison

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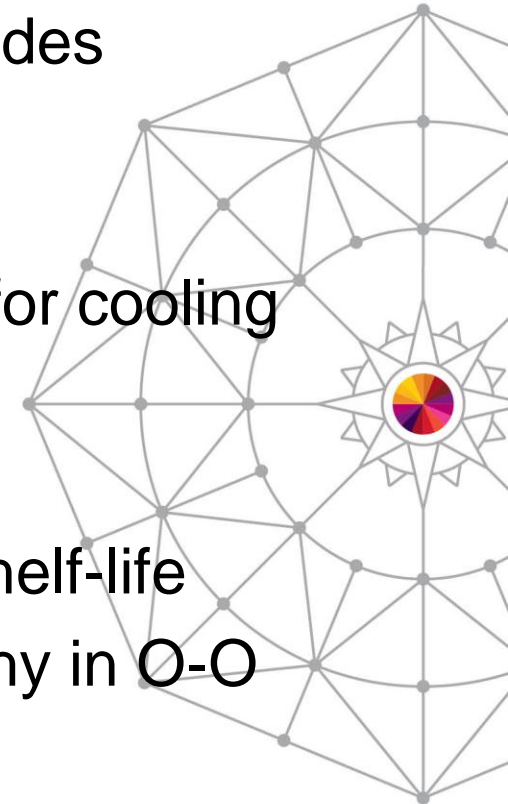


# Our Reasons for Buying zEC12

- Performance of zEC12 has been widely touted
- Less noted is ability to sit on concrete with no raised floor
  - The first full-sized mainframe ever with this capability
- We were waiting for some time for such a box because...
- We were building a new data center with no raised floor
  - The hot new thing in data center design
- Over time we got informal 'progress reports' from IBM
- zEC12 announcement was a red-letter day for us
- **Slab-floor feature was the primary selling point for us**
- I believe that this interest will deepen over time

# SCE Data Center History

- We had supported two data centers for decades
  - Old-old (O-O) opened 1974
  - Old-new (O-N) opened 1987
- Both have traditional raised floor with water for cooling
- Full refrigeration air conditioning
  - Built for multiple bipolar boxes long gone
- Both data centers eventually outlived their shelf-life
- Infrastructure was getting increasingly sketchy in O-O
- Problems were also developing in O-N
- Time came to move forward

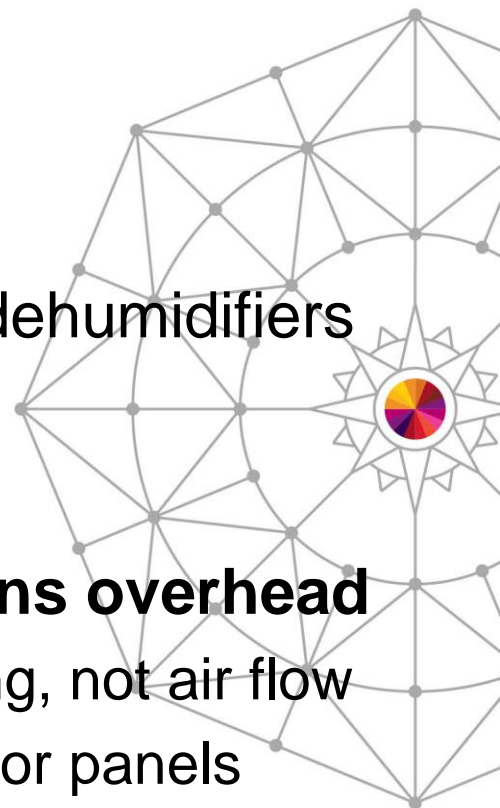


# SCE Data Center History

- Meanwhile mainframes upgraded over time to CMOS
- In 2008 we moved mainframe production from O-O to O-N
- Designed around one large z10 and one small z9
  - Data host and ‘penalty box’ respectively
  - Sacred Basket Paradigm: one CEC holds all precious eggs
  - Penalty box hosts costly utility software but holds little data
    - Also houses duplexed and alternate CF structures
  - Both CECs were later upgraded to large + small z196
- O-O became internal DR site: small z10 with CBU
- DASD mirrored from production O-N to DR O-O via XRC over DWDM (Cisco)

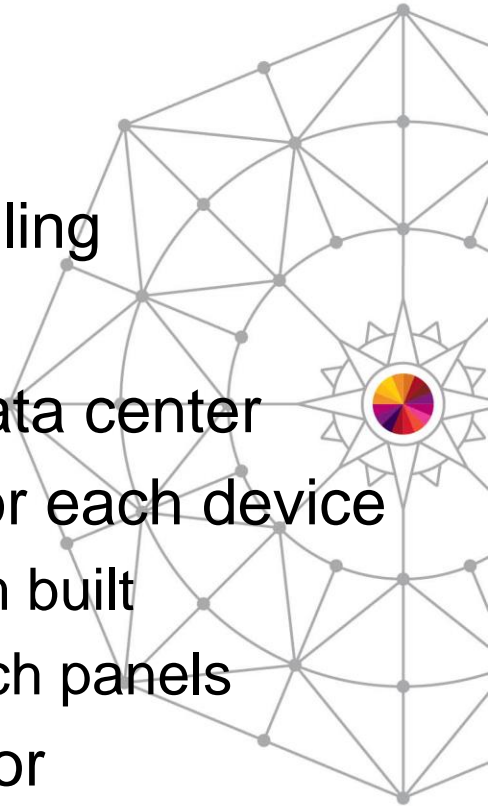
# Fuzzy View of New-New Data Center

- Built new from the ground up
- Designed to be 'greenish'
  - Not 'certified green' but follows that model
- No refrigeration, only evaporative coolers + dehumidifiers
- Alternating hot/cold aisles in contained 'cells'
- **No raised floor**
- **All cabling (power and I/O) and air flow runs overhead**
  - <begin rumor> Raised floor required for cabling, not air flow
  - On z196 chilled air pulled in through above-floor panels
  - But RF shielding depended on thick steel floor tiles
  - Shielding was IBM's major challenge <end rumor>



# Challenge – Start a new life in an unproven environment w/o raised floor

- 2 new zEC12s with overhead cabling
- New DS8000 with overhead cabling
- New tape subsystems (STK) with 'mixed' cabling
- New FICON switches (Brocade)
- New DWDM ISL (Inter Switch Link) to O-N data center
- Overhead power distribution with 'Bus/Tap' for each device
  - A computerized gizmo required in N-N, custom built
  - Overhead cabling framework with multiple patch panels
- New seismic tethering technology for slab floor
  - Each device had to be engineered individually

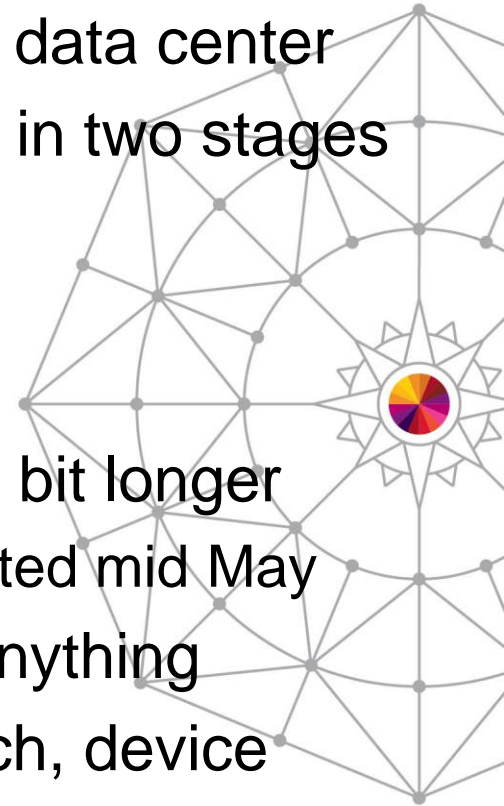


# Challenge – Migrate production to N-N with $\leq 12$ hour outage: the Big Bang

- First we moved DR function from O-O to N-N temporarily
  - No breathless rush, no risk to production, daylight hours
- Enabled validating environment including new DWDM
- On Big Bang night, we shut down production in O-N 20:00
- Initiated DR recovery in N-N via GDPS automation
- With all systems in DR mode, we transformed environment
- Edited parm libs and PROCs to run in production mode
- Then re-IPLed all as production and tested like h\*ll
- At 07:00 on Sunday, we declared N-N to be production
- Never again IPLed production systems in O-N

# Challenge – Complete project by date agreed to return old boxes to IBM

- I've never been involved in populating a new data center
- For z196 upgrade in O-N, we did a push-pull in two stages
  - Boxes arrived end of December
  - First z196 installed 3rd week of January
  - Second z196 installed 2nd week of February
- For zEC12 in N-N, we figured it would take a bit longer
  - Boxes arrived end of December, so we projected mid May
- In a new environment, you cannot assume anything
- Device problems could be chipid, cable, switch, device
- Or could be connection error or IODF error or both





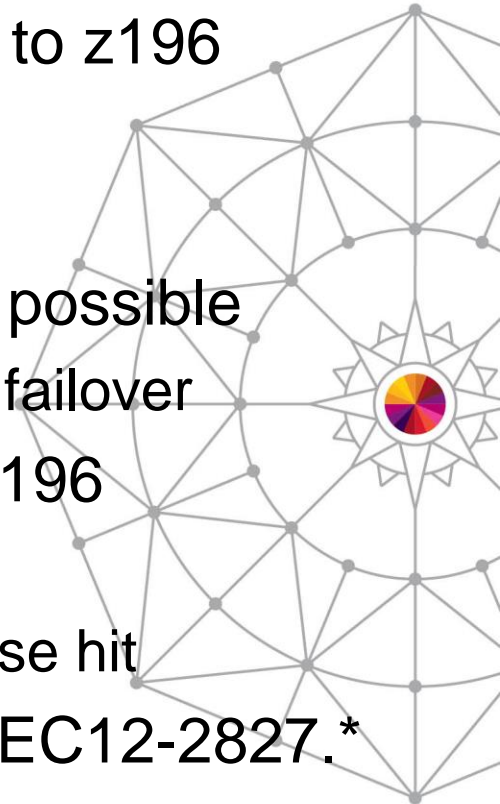
# Challenge – Getting it done

- Debugging and correcting went on for months
- **Never once did we find a problem with zEC12 itself**
- Most problems turned out to be cable or connection errors
- Some players had other duties in N-N for other platforms
  - N-N was being populated by X86, P-Series, and others
  - Mainframe did not have everyone's undivided attention
- Big Bang finally occurred in mid July
- We met the IBM contractual date
- Both 'extra' boxes have been returned to IBM
- We are once again a 3-CEC shop



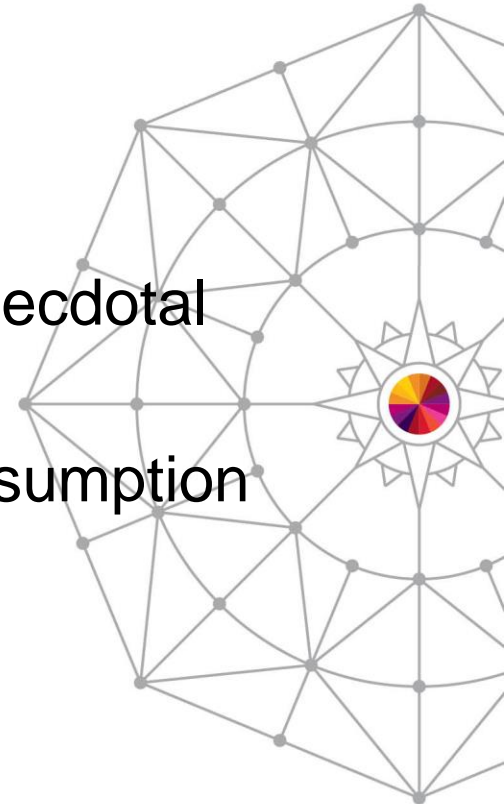
# Yes, Virginia, It Really Does Fly

- Each zEC12 was sized for MSU comparable to z196
  - Exact match not possible, but we got close
  - Reason: minimize software license hits
- Small CEC remained at model 401, smallest possible
  - 1 slow CP plus ICFs + zIIP plus CBU for local failover
- Large CEC was **reduced** by 1 CP vis-a-vis z196
  - Also has ICFs + zIIP + IFLs
  - ICF/IFL/zIIP are faster than z196 with no license hit
- z/OS 1.13 with FIXCAT IBM.Device.Server.zEC12-2827.\*
- 2 boxes support 3 parallel sysplexes + 1 monoplex



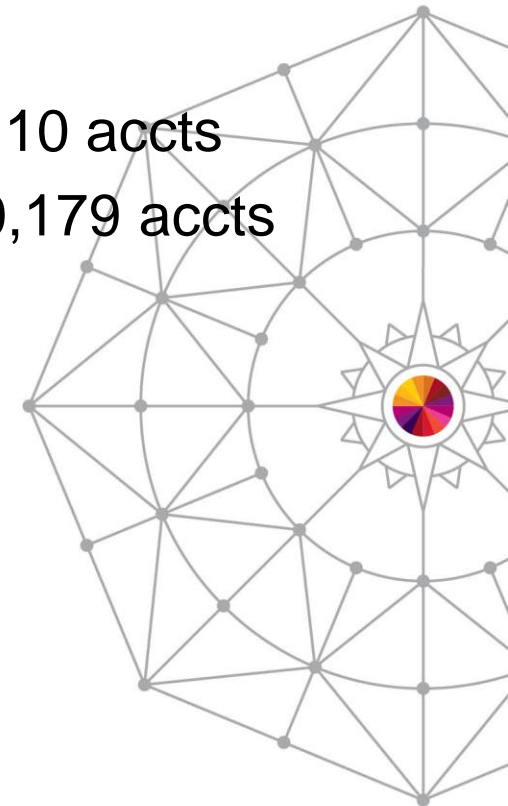
# Everyone is Smiling

- Performance has been excellent
  - Truth-in-lending: all h/w is faster in N-N
  - All devices and links upgraded to 8 GB
- Reports so far (since 7/13) are somewhat anecdotal
  - Little time so far for full analysis
- We see shorter run times with less CPU consumption
  - Batch jobs
  - CICS transactions
  - DB2 (V9) queries

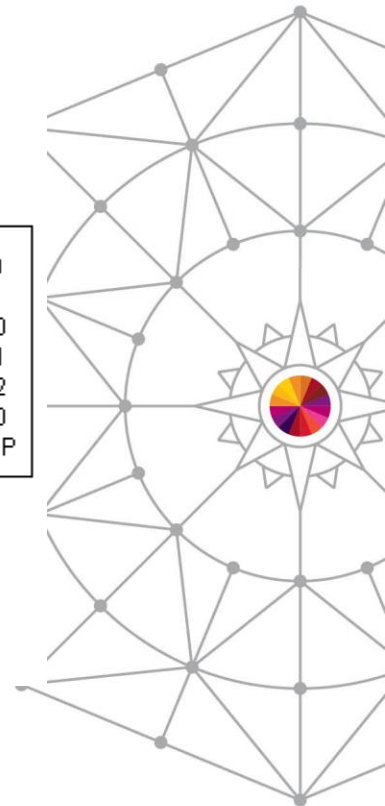
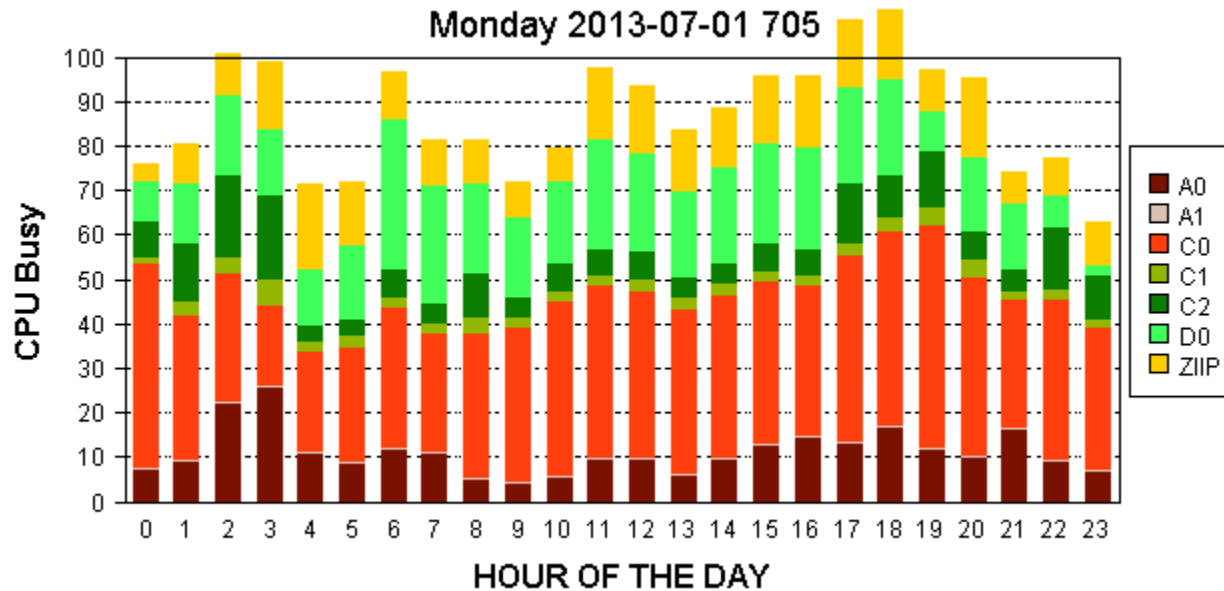


# Some Performance Examples

- A meter read generation job
  - Last run on z196: 6 min 13 sec CPU for 230,110 accts
  - First run on zEC12: 4 min 21 sec CPU for 230,179 accts
- A long running DB2/SQL job
  - Last run on z196: 42 min 18 sec CPU
  - First run on zEC12: 26 min 29 sec CPU
- A user sample of many DBA batch jobs
  - 10% CPU reduction overall

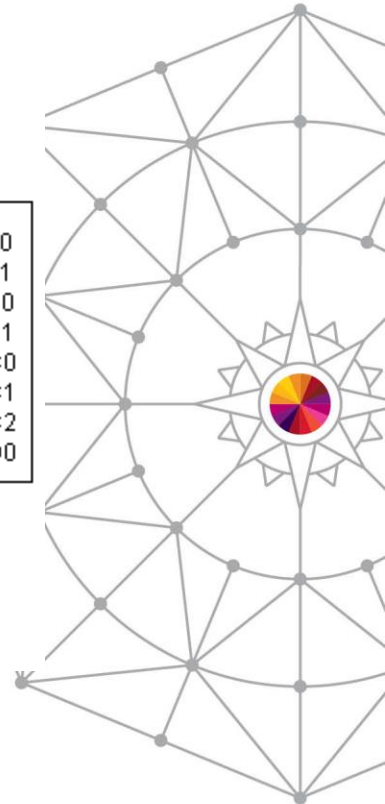
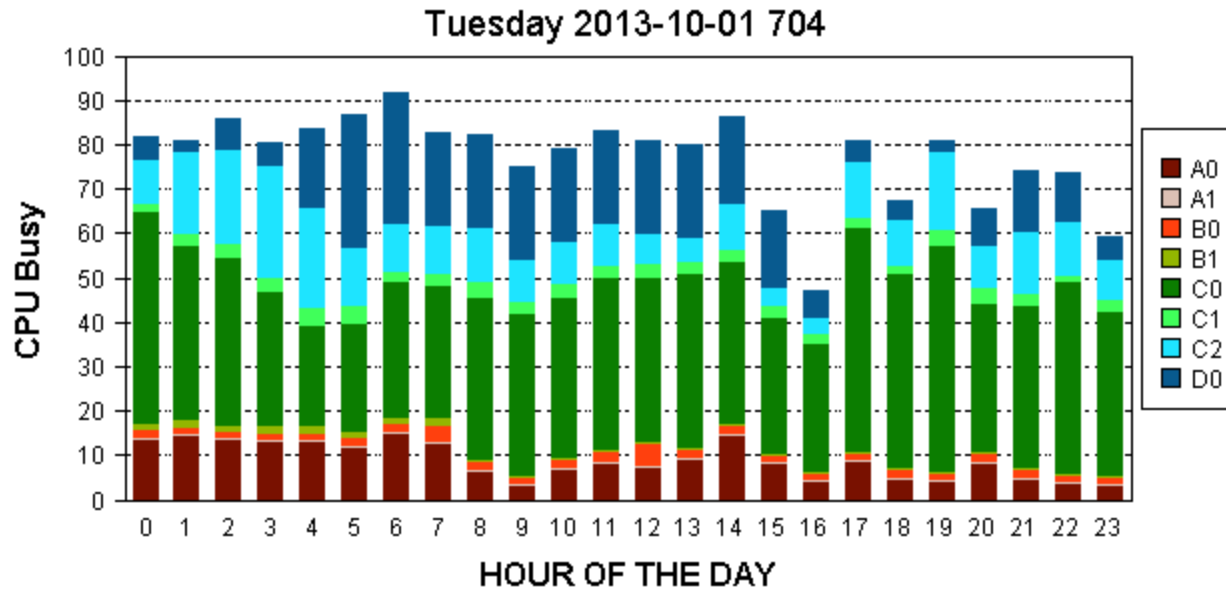


# Last Quarter End on z196



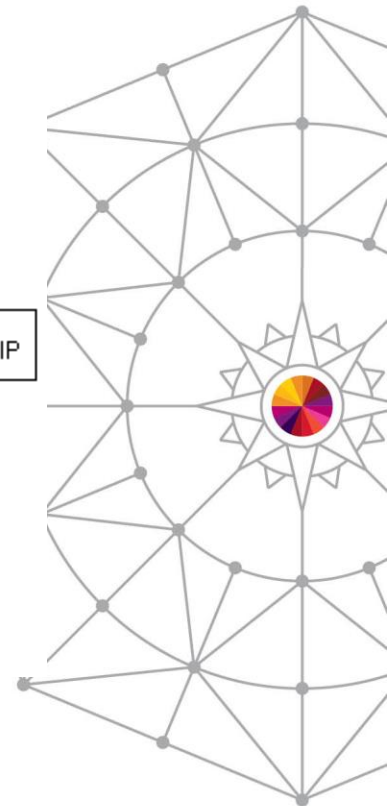
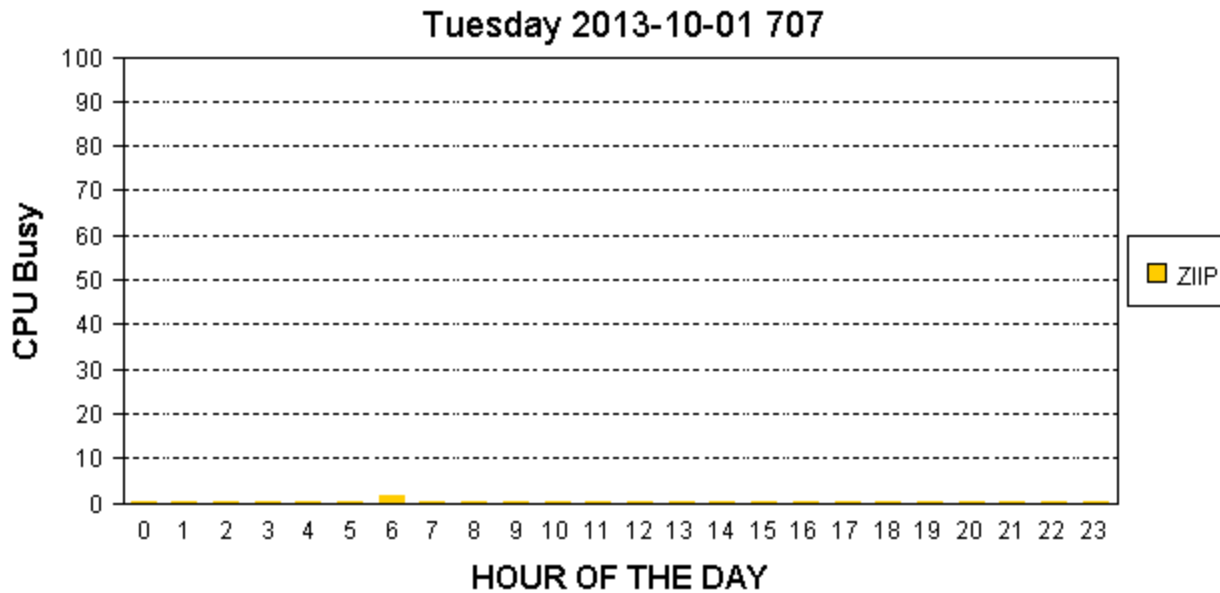
# First Quarter End on zEC12 - 1

- GP Engines



# First Quarter End on zEC12 - 2

- zIIP Engine



# Questions?

