

PTC® Live Global

## CUST 118 - Maximizing Test System Performance While Minimizing Test System Cost

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Insanity

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Albert Einstein

"Insanity: doing the same thing over and over again and expecting different results." - Albert Einstein



Anonymous PTC Admin

"Insanity: doing the same thing over and over again and actually getting different results!" - Anonymous PTC Admin



## Key Takeaways.

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Audience members will have a better understanding of:

- What considerations we used to plan out our PTC Windchill test environments
- Key choices we made to help reduce test system costs
- What worked for us in the end and why our strategy changed



## History of PTC Windchill at Daktronics

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- We rolled PTC Windchill 8.0 out to our company on January 23, 2008 ([Add Picture](#))
- We use PTC Windchill primarily to manage CAD Documents (PTC CreoParametric and AutoCAD)
- We've updated the system on a regular cadence throughout the years and are now live with PTC Windchill 10.2 M020.



- Some of our current system stats are:
  - Vault Size:
    - Current growth rate of approximately 1 TB per year
  - Number of Vault objects:
  - Database Size:
- One interesting note, about 90% of our PTC CreoParametric models are family tabled.



- Implement WTParts – Equates to huge process changes for Daktronics

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### CUST123 PLM Organizational Change Management

Monday, June 8 5:00 PM - 5:45 PM

Presenter(s): [Amy Mueller](#) Purdue University, [Cassie Fuls](#) Daktronics, [Jay Nallani](#) TE Connectivity, [Manoj Jhaveri](#) Vitamix, [Sarah Sedgman](#) PTC

PTC Product Family/Content Theme: PTC Windchill

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Oh, and they will have BEER...I think it is even FREE !!

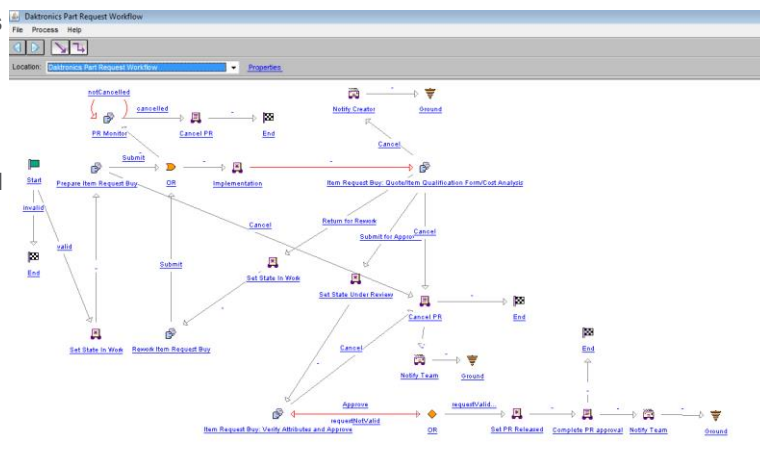


- Manage more Product documents.

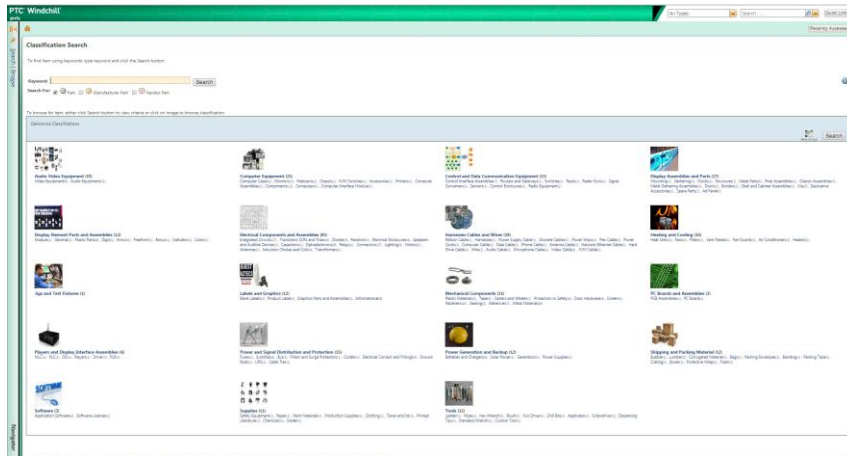


- Implement workflows
  - Change Notice for CAD Documents and WTParts
  - Promotion Request for Documents
  - Part Request for Buy parts

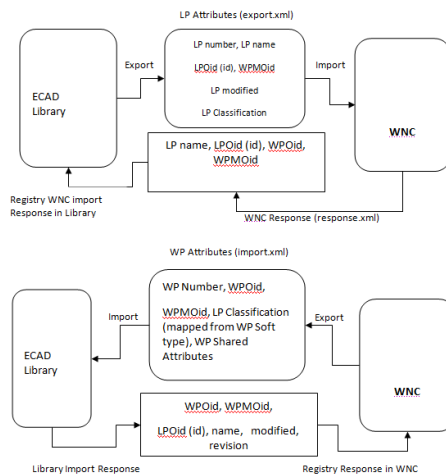
– CUST231 Simplified Purchased Parts Process Management – Tuesday, June 9 2:15 PM – 3:00 PM



- Implement Classification (PTC Windchill PartsLink)



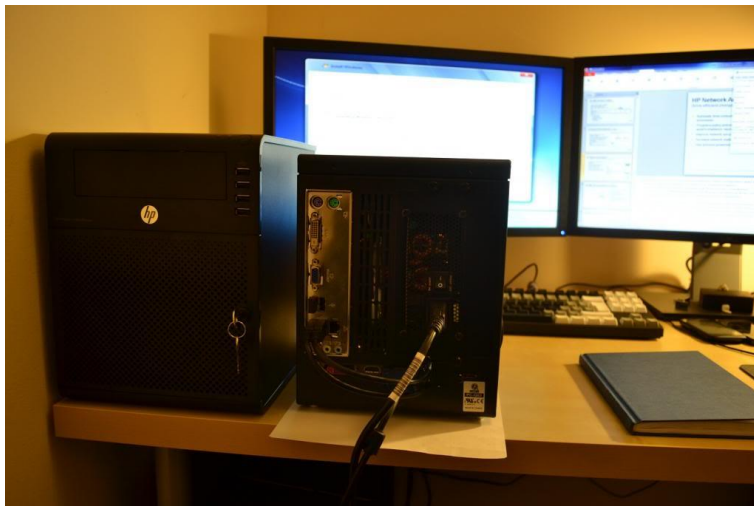
- Phase 1.1 Implement Cadence to PTC Windchill integration



- Ideal Solution (No budget limitations)



- Realistic Solution Options (budget limitations)



- **How many test environments are needed**

- UAT (User Acceptance Testing)
  - Minimal down time, Used by multiple end users for final testing and building training documents.
- DEV (Development)
  - More accepted down time than UAT, Used by PTC Windchill Business Administrator and Customization Development team
- TST (Initial Testing)
  - More down time than DEV, Used by PTC Windchill System Administrator and PTC Windchill Business Administrator to a lesser extent.



- **Server Types reviewed**

- Physical Box
  - Quicker back in the day, prior to VM
  - We did this for PTC Windchill 8.0
  - Our current production is still setup this way.
- Physical Server Box
  - This is the most expensive option.
  - There aren't any shared resources with this option, which is its biggest appeal.
- VM Server Box
  - Most cost effective option
  - Uses shared resources + overhead
  - Our current test environment is setup this way.





- Hardware (Compared to storage, all other hardware doesn't create a significant cost concern, but storage is expensive)
  - Feel free to talk hardware details with Tyler after this presentation
  - [Add Picture of Tyler here](#)



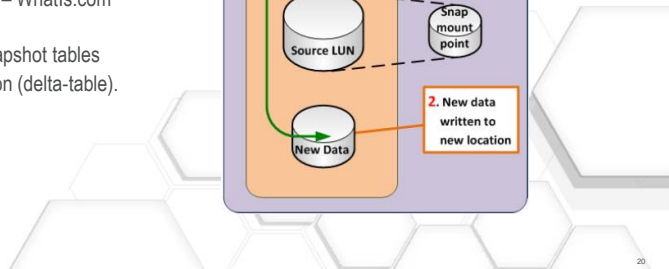
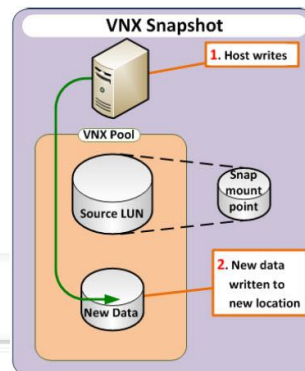
- Vaulting Option 1 - Each environment has individual vaults
  - Consumer grade drive storage won't cut it. Why you ask?
    - "There is most definitely a difference between consumer stuff and 'enterprise' (or commercial or OEM or whatever you want to call it). Consumer stuff is designed to service 1 person at a time." –Michael Kilmer
  - Commercial grade drive storage is expensive
    - Approximately \$5/gig
      - » 2 TB = \$10,000
      - » 16 TB = \$80,000



- Vaulting Option 1 - Each environment has individual vaults
  - Full copy of Production
    - Most expensive
    - Most accepted by end users
    - We are now using this setup
  - Partial copy of Production
    - Requires less space so more cost effective than full copy of production
    - Incomplete data in a UAT environment was unacceptable.



- Vaulting Option 2 - Environments Share Vaults via a “snapshot” of the Vault drive.
  - Vocabulary
    - What is a “snapshot”?
      - “Snapshots are point-in-time views of a LUN that can be made accessible to another host, or be held as a copy for possible restoration.” – EMC
    - What is a “LUN”?
      - A logical unit number (LUN) is a unique identifier used to differentiate separate devices (each of which is a logical unit) as addressed by a SCSI, iSCSI or Fibre Channel (FC) protocol. – Whatls.com
  - This snapshot approach uses master tables and snapshot tables as a basis to determine the required delta information (delta-table).

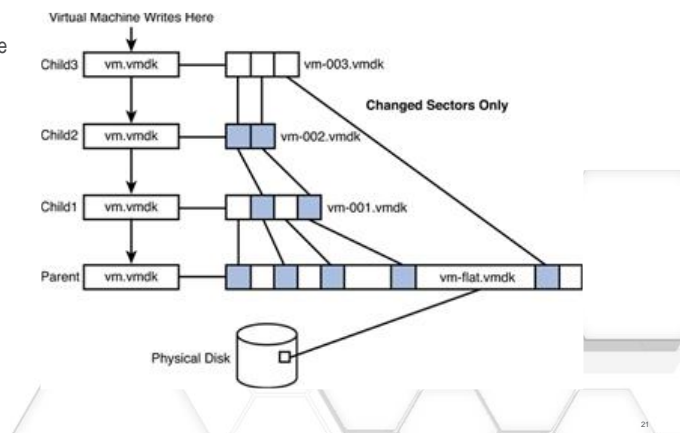


- Vaulting Option 2 - Environments Share Vaults via a “snapshot” of the Vault drive.

- Vocabulary

- What is a “delta-table”?

- The content of a snapshot table represents the last state of object data that was imported.
      - A master table contains the most recent state of object data in the database.
      - The delta view (delta-table) is the difference between the tables
      - Due to hardware age, our delta-table size was limited to 2 TB.



- Vaulting Option 2 - Environments Share vaults via a “snapshot” of the Vault drive.

- Snapshot strategies

- Snap against Production

- Both DEV and UAT will share a delta-table against the Production snapshot
      - This option only requires a 2 TB delta-table

- Snap against a shared Test

- Both DEV and UAT will share a delta-table against the “Test” snapshot.
        - » This option would require an 8 TB drive to house all Productions Vault data
        - » It also requires the 2 TB delta-table

- We initially chose the “Snap against Production” strategy.



- **What worked**

- Using snapshots drastically reduced the storage space needed, which reduced cost.
  - \$10,000 vs \$80,000
- When the delta-tables weren't full, or almost full, using snapshots was a great strategy to save on storage costs.



- **What didn't work**

- Shared delta table was only 2 TB and filled up within a week once we performed our data migration steps
- Once the delta-table was full, a system refresh was required.
- A system refresh caused a full re-configuration of our test systems.
  - This did give me multiple opportunities to fine tune the Deployment (configuration) and Data Migration documents/scripts, and collect accurate timings of these processes.



- What we adjusted and why we adjusted it
  - Ultimately the frequency of the system refreshes cost us too much time so we changed our vaulting storage strategy.
  - Now both UAT and DEV have independent vaults. We found time was more valuable than money.



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