Successful Strategies for Rapidly Upgrading PTC Windchill 9.1 to Windchill 10.1 on a Light Budget

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Biography

Dr. Charles A. (Chip) Shearrow

• 1991-June 2000: Ohio Northern University (Advanced Robotics and Automation)

• 1998- Summer: Proposal for the Design Data Management System

• 1999- Summer: NASA-JSC Directors Grant for Virtual Simulation


• January 19, 2011- Present: MEI Technologies at NASA-JSC (IRD Operations Supervisor, Senior Systems Engineer)

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Introduction

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The Frugal Times

- Economic uncertainty
  - Economy
  - Continuing Resolution
  - Shift to commercial space flight

- Budget restraints
  - Personnel reductions
  - Environment reductions
  - New equipment guidelines

- Still need to maintain corporate operations
  - Operations for Johnson Space Center
  - Managing engineering data for International Space Station flights
  - Operations for general research
  - Managing engineering data for Multi Purpose Crew Vehicle (MPCV)
  - Staying current with software and hardware

I want you
do more with less.
to be FRUGAL

Public Release # xxxx
Historical Upgrade Process

- Purchase/obtain new servers for the upgraded environments
- Establish additional network and storage resources
- Establish the new system environments
- Integrate Active Directory (AD) authentication with webserver
- Load Windchill and integration custom code
- Run WinDU reports and repair data if needed
- Load systems with production data
- Regression test systems
- Train users
- Perform many runs against the database
- Release system to users

(8.0 to 9.1 took 15 months to complete)
Planning for Possible Constraints

Things to Consider:

- **Age of the current hardware**
  - Speed and capability of the current servers to support new software
  - When is the refresh planned

- **Technological Changes**
  - Traditional racked servers?
  - Virtual servers local?
  - Virtual servers remote?
  - Cloud services?

- **Budget challenges**
  - Reduced services
  - Reduced personnel
  - Customer initiated paradigm shift

- **User Environment**
  - Constantly changing with no control of the changes and their timing

- **Corporate events**
  - Management tasks
  - Contracts changing
  - Personnel changes
  - Environmental changes
  - Policy changes

- **Software compatibility between:**
  - Current and upgraded PDMLink system
  - CAD software and PDMLink
  - Web browser and CAD software
  - Workstation OS and web browser

- **Critical software release dates**
  - Contracts using the system
  - Major events with projects
  - User training
  - PTC release dates
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Reference: Windchill90M080SoftwareMatrices081909.pdf
In Place Upgrade Process

All activities performed in all existing environments

• Pre-upgrade Activities
  – Run WinDU reports to insure data transferability
  – Upgrade server
  – Upgrade Windchill components
  – Upgrade database
  – Build migration installation

• Upgrade Activities
  – Move migration installation
  – Run migration tool
  – Upgrade Apache
  – Test upgrade

• Post Upgrade Activities
  – Establish keyword index
  – Bulk publish viewables
  – Rerun WinDU reports
Pre-Upgrade Activities

All performed in place on existing environments

- Run WinDU reports
  - To insure data integrity for migration
  - Roughly 14 million objects including Apollo, Shuttle, Station to Multi Purpose Crew Vehicle (MPVC) or Orion

- Upgrade server
  - Solaris upgrade from version 10 03/05 to Solaris 10 08/11
  - Upgrade file system to ZFS for file system and volume management, snapshots and clones, continuous integrity checking and automatic repair
  - Java upgrade from 1.6.0_18 to 1.6.0_27 for compatibility and security

- Upgrade Database
  - From Oracle 10.2.0.4 to 11.2.0.3+

- Build Migration Installation
  - To be used for the upgrade manager
  - Testing the upgraded customizations

- Directory Service (DS) Upgrade
  - From 1.2 to 2.3

- PSM Install
  - Monitor usage before and during rollout
  - Tuning of the new system

- MCAD Workers Upgrade
  - From WF4 to Creo2

- Customizations Upgrade
  - From 9.1 M50 to 10.1 M30
  - Minimize moving forward customizations
Upgrade Activities

• **Move 10.1 System**
  – Move to the master servers file system for speed
  – Can be done on a live system
  – Live system is stopped once to test migration system
  – Test functionality

• **Apache Upgrade to 2.2.21**
  – Place in environment
  – Test for functionality

• **Run Upgrade Manager**
  – Backup database and code base
  – Redirect resources between 9.1 and 10.1 PDMLink
  – Run upgrade
  – Test upgraded system
Post Upgrade Activities

- **Viewable Regeneration**
  - Bulk publish all the CAD objects in the system

- **Indexing Generation**
  - Reindex the system with SOL (new indexing software)
    - Documents first
    - Larger files second
    - Zip and last

- **WinDU Reports for 10.1**
  - Run to insure data integrity after upgrade
  - Create a baseline for future loads

- **Resource Return**
  - Return virtuals used for upgrade
  - Return storage copies used for upgrade
Results of The Upgrade

- System outage started on **Thursday April 4th** at 5:00pm
  - Ended on XXXX
- Backups ran from xxx to xxx
- Upgrade Manager ran from xxx to xxx
- Regeneration of Viewables
  - ran from xxx to xxx
- Regeneration of Keyword Index Status
  - XXX
- WinDU Reports for 10.1 results
  - XXX
Tips for An Upgrade On A Shoestring Budget

• Upgrade current system components in place avoiding the purchase of new hardware

• Migration environment can be a virtual machine zoned on one of the existing servers

• Transferring the migration environment to the same server as the environment to be upgraded eliminates all the network slowness

• The only extra resource needed was the storage for the production database and for the data to be placed against the staging environment for a one to one comparison run against the production environment.

• Coordinate the upgrade with everyone from the users to management to avoid scheduling pitfalls and software incompatibilities

• To use the updated DS with 9.1, you will have to obtain a “fix” from PTC
Tips for An Upgrade On A Shoestring

• Upgrade
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