Overview

• Challenges of technology in the pharmaceutical industry
• How virtualization can be used to overcome challenges
Challenges for System Providers

• Maintaining access to multiple software revisions
• Supporting legacy systems as technology advances
• Providing customers with computer replacements in the event of a failure
Challenges for System Users

• Risk of running legacy systems
  – Maintaining disaster recovery procedures
  – Excessive downtime if legacy software or hardware cannot be replaced after a failure

• The cost of maintaining a stock of obsolete components

• Time required to qualify a system upgrade
Features of Virtualization

• Multiple virtual computers can run on a single host computer
• Replicates hardware and software
• Provides a layer of abstraction between the physical computer hardware and software
Virtualization in Project Phase

- How to access multiple software revisions
  - Developers can install multiple versions of the same software on different VMs

Software Lifecycle

Concept
- Define requirements

Project
- Specification
- Develop & test software

Operation
- Improve or add functionality

Retirement
- Removed or replaced
Virtualization in Project Phase

- Setup time for customer computers is reduced
- Computer setup quality is increased
Project Phase at Benefit

- Reduced customer computer setup time from 8 hours to 1 hour
Virtualization in Operation Phase

- Ability to access multiple systems on one physical computer

Software Lifecycle

- Concept
  - Define requirements

- Project
  - Specification
  - Develop & test software

- Operation
  - Improve or add functionality

- Retirement
  - Removed or replaced
Operation Phase Benefit

- Ability to support multiple operating systems and software revisions
- Eliminated a room of obsolete computers
Virtualization in Operation Phase

- Virtual machines of legacy systems can run on modern host computers and operating systems
- The amount of time a system is in the operation stage can be increased

Software Lifecycle

- Define requirements
- Specification
- Develop & test software
- Removed or replaced
- Improve or add functionality
- Operation
- Concept
- Project
- Retirement

ISA Tarheel Capital Area Section
North Carolina Biotechnology Center
ISPE Carolina-South Atlantic Chapter
Virtualization in Operation Phase

- Disaster recovery procedures are simplified
- Eliminates stock computers
- The consequences of a disaster have less impact
Customer Benefits

• Software is no longer linked to hardware and O/S restrictions
• Support personnel can access a copy of the VM

Software Lifecycle

- Concept
  • Define requirements

- Project
  • Specification
  • Develop & test software

- Operation
  • Improve or add functionality

- Retirement
  • Removed or replaced
Customer Benefits

- In case of computer failure the VM can be placed on a standard new computer

Software Lifecycle

- **Concept**
  - Define requirements

- **Project**
  - Specification
  - Develop & test software

- **Operation**
  - Improve or add functionality

- **Retirement**
  - Removed or replaced
Retirement Phase

- VMs can be easily transferred and replicated for data access

Software Lifecycle

- Concept
  - Define requirements

- Project
  - Specification
  - Develop & test software

- Operation
  - Improve or add functionality

- Retirement
  - Removed or replaced
Summary

• Virtualization can be used to improve system quality, reduce setup time and provide better customer support.

• Customers who utilize virtual machines can increase the system operating life, improve disaster recovery procedures, and create easier access to data in the retirement phase.