System Organization

Repository model characteristics

Advantages
- Efficient way to share large amounts of data
- Sub-systems need not be concerned with how data is produced
- Centralized management e.g. backup, security, etc.
- Sharing model is published as the repository schema

Disadvantages
- Sub-systems must agree on a repository data model. Inevitably a compromise
- Data evolution is difficult and expensive
- No scope for specific management policies. Difficult to distribute efficiently

Client-server architecture
- Set of stand-alone servers which provide specific services such as printing, data management, etc.
- Set of clients which call on these services
- Network which allows clients to access servers

Advantages
- Distribution of data is straightforward
- Makes effective use of networked systems. May require cheaper hardware
- Easy to add new servers or upgrade existing servers

Disadvantages
- No shared data model so sub-systems use different data organization. Data interchange may be inefficient
- Redundant management in each server
- No central register of names and services - it may be hard to find out what servers and services are available
Abstract machine model (Layered Model)
- Used to model the interfacing of sub-systems
- Organizes the system into a set of layers (or abstract machines) each of which provide a set of services
- Supports the incremental development of sub-systems in different layers. When a layer interface changes, only the adjacent layer is affected
- However, often difficult to structure systems in this way.

Figure: Layered model of a version management system

<table>
<thead>
<tr>
<th>Configuration management System Layer</th>
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<tbody>
<tr>
<td>Object management system layer</td>
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<tr>
<td>Database system layer</td>
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<tr>
<td>Operating system layer</td>
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Configuration management System Layer:
- It manages versions of objects that supports these configuration management facilities.
- It uses object management systems that provide information storage and management services for configuration items or objects.
- This system is built on top of a database system to provide basic data storage and services such as transaction management, rollback, recovery and access-control.

Advantages:
- This approach supports incremental development of systems.
- This architecture is changeable and portable.

Disadvantages:
- Structuring the systems in this way is difficult.
- Performance may be a problem