

Age of Cloud-based Applications: Opportunities and Challenges

Ashish Mishra and J. Mark Tuthill

*Department of Pathology and Laboratory Medicine,
Henry Ford Health System, Detroit, MI, USA.*

Background

This presentation explains our initial experiences and challenges with deployment of new thin client (browser) based LIS and image management systems in the Department of Pathology and Laboratory Medicine at Henry Ford Hospital, Detroit, MI. A thin client is an application that runs from resources stored on a central server instead of a localized hard drive. Thin clients work by connecting remotely to a server-based computing environment where most applications, sensitive data, and memory, are stored. Thin clients offer several benefits, including reduced cost, increased security, more efficient manageability, and scalability. A “fat client” refers to a typical software installed on a personal computer/ CPU that does all its own data processing. Fat clients are more difficult to secure and manage, costlier to deploy, and can consume a great deal of energy. They generally require more powerful and costlier hardware than thin clients, but also typically have more features. We at Henry Ford Hospital have adopted a browser-based approach to using thin clients, which means that an ordinary PC connected to the internet carries out its application functions within a web browser instead of on a remote server. Data processing is done on the thin client machine, but software and data are retrieved from the network. We have successfully transitioned to thin client versions of AP LIS (Sunquest Vue), AP Image Management system (ARCC), Biobank Automation Software (BTM) and Document Control system (MasterControl).

Advantages

- Lack of software installation
- Wide distribution
- Ease of license distribution
- Ease of scaling
- Easy maintenance
- Easy updates
- Lower costs
- More security
- Ability to use personal laptops/ computers using VPN
- Small Form Factor Clients are sufficient for wide-scale deployment
- Support Workstation on Wheels (WOWs) while being compliant with HIPAA

Challenges

- Single point of failure – Server failure may result in every client getting affected
- Powerful servers are needed to deploy these applications
- Browser wars may result in incompatibility of the application with your favorite browser

- Challenges in connectivity to cameras, printers etc.

Technology

- Servers running the database application
- Small Form Factor PCs running Windows 10 across the health system
- Browsers (Microsoft Edge, Google Chrome etc.)
- Microscope and gross station digital cameras with TWAIN drivers

Conclusions

The adoption of Thin-Client computing is going to increase exponentially in future as more and more software developers are moving towards it. We have identified several challenges in implementing thin-client computing in Pathology using our experience, as it is still in early stages of development. These are teething troubles and will go away once this becomes the new standard of interacting with applications.