



## ORAL PRESENTATION

# Network for whole slide imaging (WSI) clinical usage

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### Background

IT technologies are improving daily; at the same time, network security rules are becoming more complex. These factors make it more difficult to design an optimized WSI system and network.

### Methods

Four different WSI systems were used and each had a different structure and a data format over the network. The standard PC in our department is Microsoft Windows XP Professional version 2002 Service Pack 3 and CPU is Intel Core 2 CPI 6300 1.86GHz with 1GB or 2GB of RAM. The network bandwidth is either 10, 100MB/s. The storage server is Quad-Core-2.33 GHz Zeon Processors, 18GB RAM, and 5TB SAS RAID array; OS is Windows 2003 server. All scanners are connected to the storage server by 1GB. 5 TB NAS is used to optimize storage capability.

We examined the network and GUI performance for different purposes under varying conditions. All viewers were an open HTTP message interface to enable client software to incrementally access image information and view data.

Images were located in the internal storage server, and in three outside servers. Screen resolution was 1280x1024 pixels. Basic viewer study, the time to data completion was measured at seven conditions. All data were an average of three measurements. JPEG 2000 performance was compared with JPEG. The time to complete the 3D model was measured. Nine of Multilayer Cytology specimen was used and compared comfortableness to view the multiple focus planes.

### Results

- The amount of computer memory is more important than network speed when images are accessed externally via the internet. Computer memory is also more important when images are compressed with JPEG2000.
- Network speed is more important when images are accessed locally through the intranet and compressed with JPEG.
- An external hard drive could be useful. However, the particular network conjunctions still might affect the speed at which images could be accessed.

### Conclusion

Our network conditions are not yet ideal for many reasons, including budgetary constraints, institutional policy, etc. The data we have been collecting will be very useful when we begin planning upgrades to our WSI network/server with out network specialist.

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