

e-Diagnostics Working Group Meeting

e-Diagnostics Single Wire Resolution Team Report

Dave Bloss, Intel

September 20, 2000

Team Objective

- **Define a guideline for the number of logical and physical connections between a production tool and the factory network**

Team Membership

Single Wire Resolution	Dave Bloss (Intel)	Reza Bonabi (KLA-T) Dave Busing (KLA-T) Jim Chalmers (KLA-T) Ray Bunkofske (IBM) Bob Wiggins (IBM) Juan Bocanegra (AMAT) Shay Assaf (AMAT) Margaret Pratt (ISMT) Neil Frank (AMAT) Frank Kaplan (AMAT)
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Any Other Members??

Single Wire Process

- **Single wire definition process**

- Review network bandwidth study results - DONE
- Review data taxonomy results - DONE
- Review capability taxonomy results - DONE
- Review security guidelines - DONE
- analyze options - IN PROGRESS
- recommend guideline - IN PROGRESS

Single Wire Guidelines

- **e-Diagnostic connection and traditional SECS/GEM connection must be logically separated**
- **Equipment must support single or dual network connections**
 - allows for cost savings if low e-Diagnostic capabilities are required/desired.
 - allows legacy tools to be retrofit with auxiliary CPU's to enable e-diagnostics
- **Single point of control on the tool to deal with control requests from e-Diagnostics and the SECS/GEM connection**
 - ensure safety, contention and deadlock issues are handled
 - ensure that the tool CPU(s) do not get overwhelmed with e-diagnostic requests
 - configuration must exist for the types of control the eDiagnostics connection can have on the tool

Single Wire Considerations

- All e-diagnostics communications (request and reply) go through e-diagnostics port
- Only e-diagnostics messages are accepted on the e-diagnostics port
- The tool must be smart enough to ensure proper wafer processing, no compromises are allowed because of other requests including e-diagnostics
- Requests which would push the bandwidth (CPU or network) over the limit are rejected (return code -1 or some such) to avoid problems.
 - **would be dealt with at the application level. [it could also be dealt with at the tool if the tool is smart enough RJB]**

Single Wire Considerations

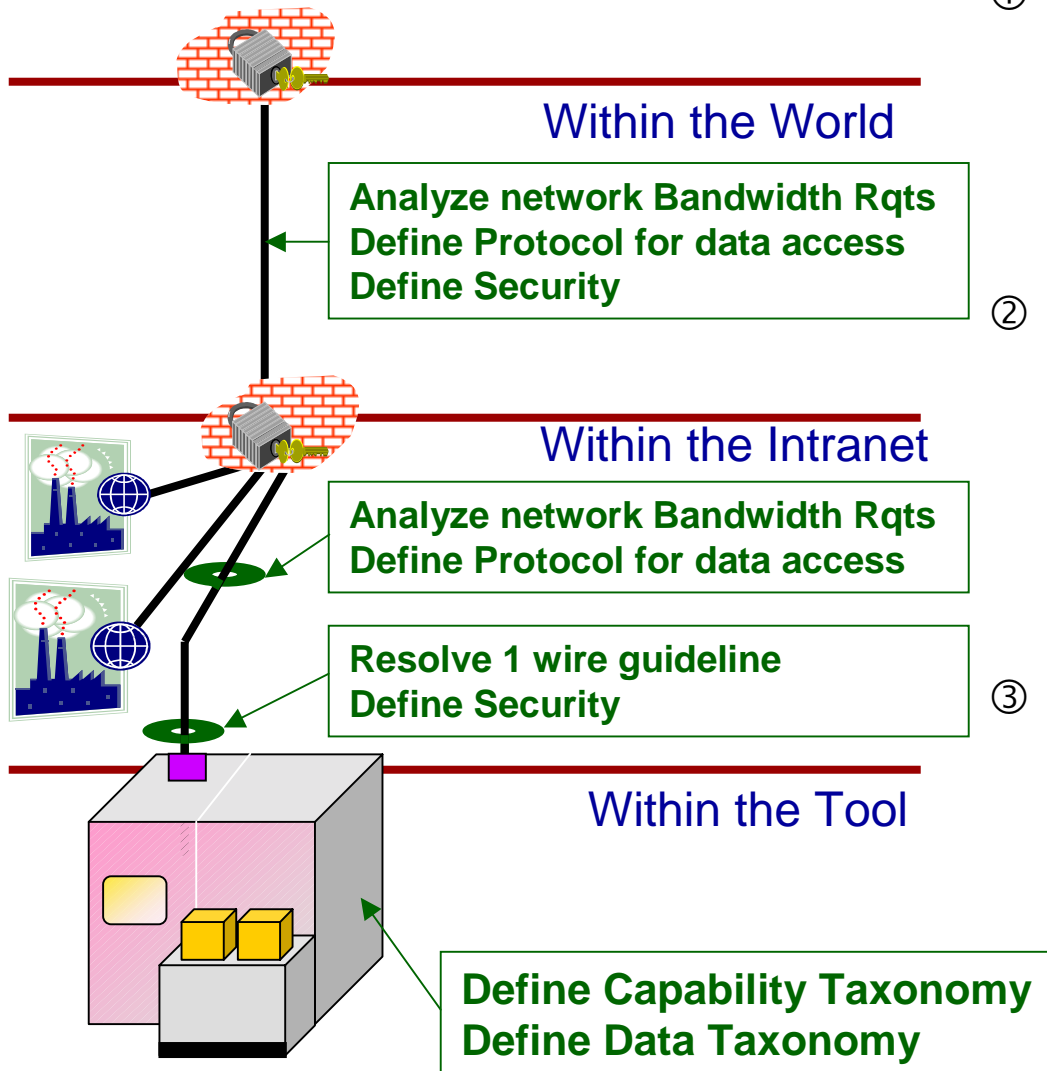
- Possibly implement a "gateway" application to prevent overloading the tool [or network].
 - **This would require checking with other software components of the fab to know how close to the edge the various components are.**
- All e-diagnostics functions to be controlled by customer
 - **probably through a configuration table**
- Customer performs all authorizations
- Need a way of coding in business practices (ie no log file transfer during recipe download)
 - **Some sort of e-diagnostics state model**

Single Wire Next Steps

- **Gather input from the WG** **TODAY**
- **Complete discussions and wrap guideline in a document** **9/27**
- **Discuss guideline with Japanese** **10/5**

Reference

e-Diagnostics Capability Definition



① Reduce MTTR

- Basic remote access to tool data
- Equipment experts can review and analyze 'raw data' from anywhere in the world

② Proactive Monitoring

- Monitor leading indicators / summary data
- Some external system or people analyze the data and predict future tool behavior

③ Predictive / Preventative Maintenance

- Automatic identification of pending failures by the process tool
- Automatic action of tool to fix the issue
 - e.g. order spare part, call service representative, etc.