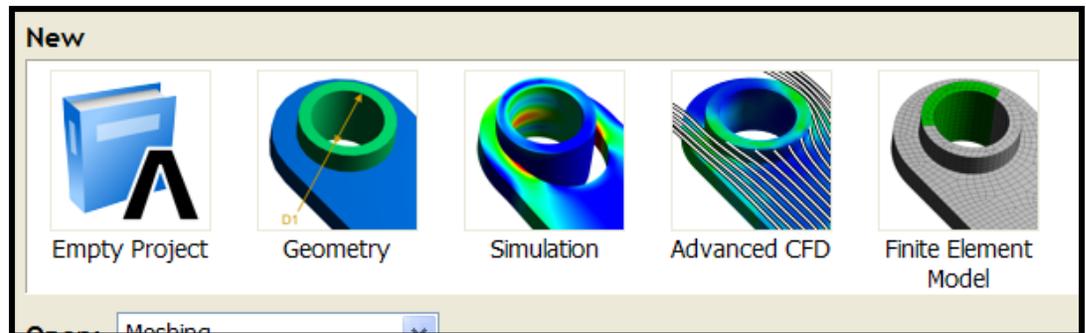


# Analysis Strategy 2009 to 2011

## Discussion Topics

- Current Issues
- Goals
- Licensing
- Remote Compute Server
- NX
- Teamcenter
- Other
- Comments and Questions

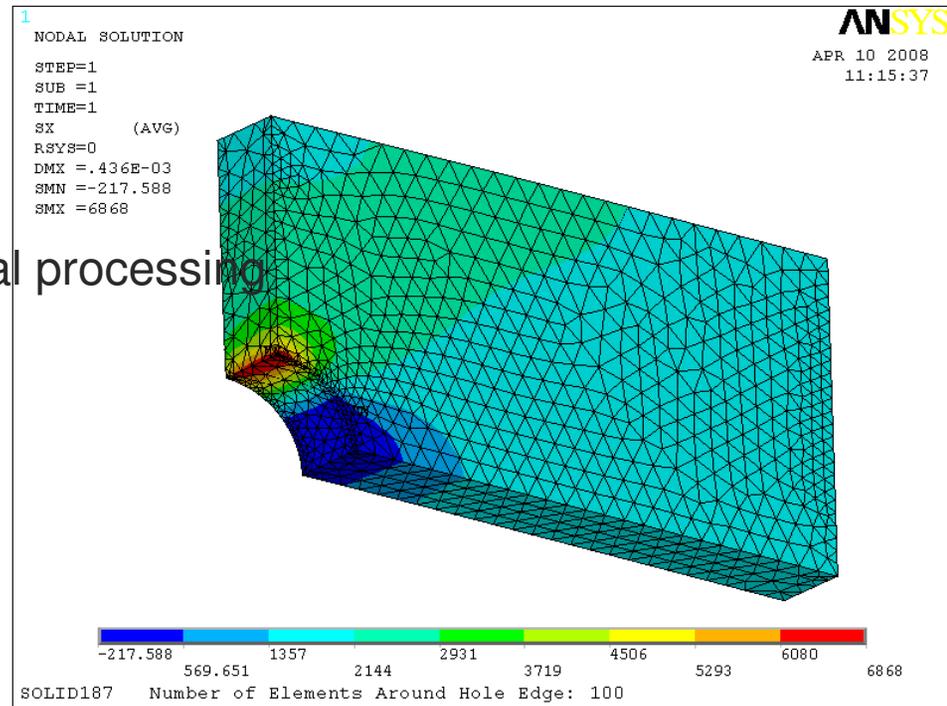


# Analysis Strategy 2009 to 2011

## Current Issues

### Issues:

- User idle time during local processing
- Licensing denials
  - Mechanical
  - Multiphysics
  - Design Modeler
- Remote compute server
  - Underpowered
  - Not easy to use
- Cleanup after data import

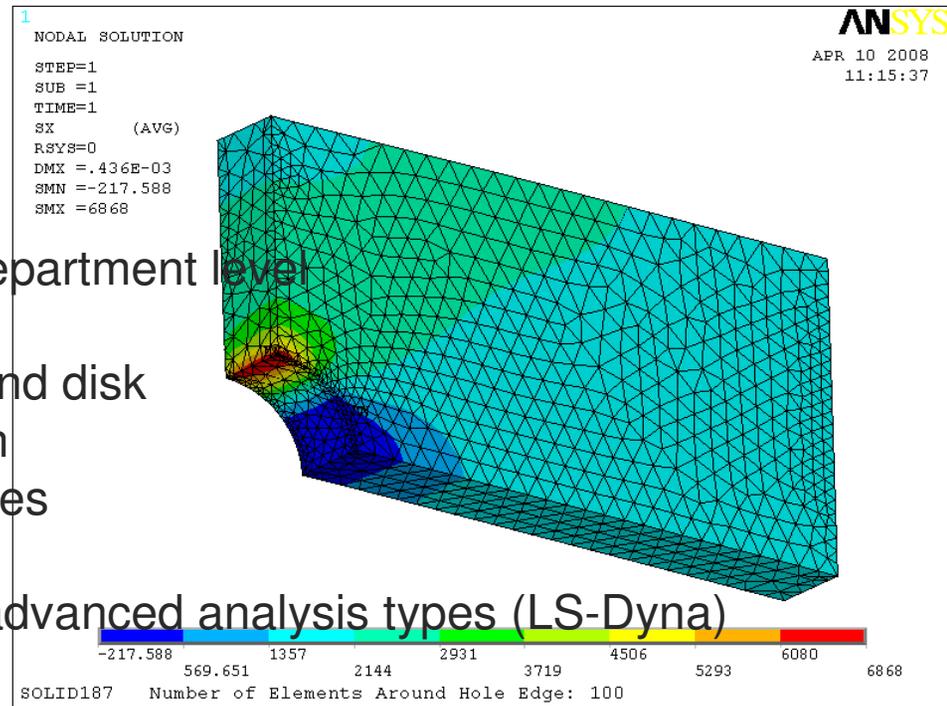


# Analysis Strategy 2009 to 2011

## Current Issues

Issues:

- Additional spending at department level
- High end machines
- Extended memory and disk
- RAID 0 configuration
- Disk failure issues
- No consistency
- No method to evolve to advanced analysis types (LS-Dyna)



# Analysis Strategy 2009 to 2011

## Goals

### General Strategy:

- Remote compute server to free up large local workstation runs
- Add licenses and change process to alleviate license denials
- Remote compute server
  - Powerful enough to use
  - Easier to use
- Extend analysis models to > 5 million degrees of freedom
- Minimize issues after importing model geometry
- Evaluate tools to evolve analysis

# Analysis Strategy 2009 to 2011

## Goals

2009:

Upgrade to 16gb on existing remote compute server

Add 2 HPC licenses to run a 4 cpu system

Add 1 ANSYS Geometry Interface for NX

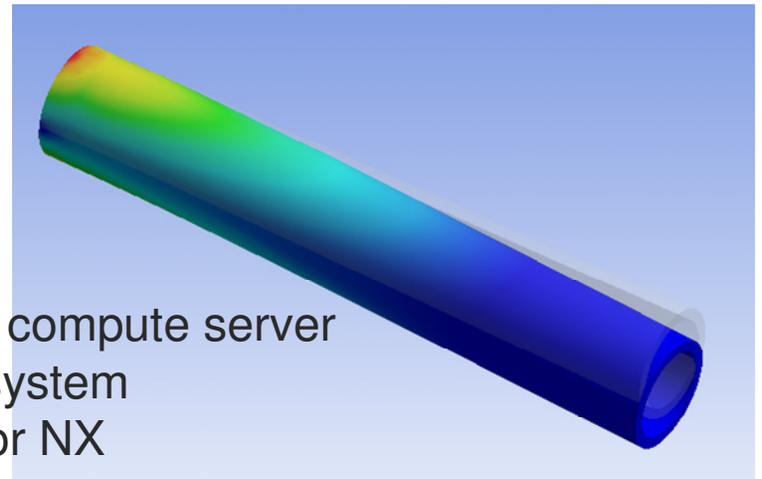
Evaluate and create queue system

RSM – ANSYS product single queue multiple CPU's (No cost)

Condor – Used in other parts of Fermilab (No cost)

PBS – No cost

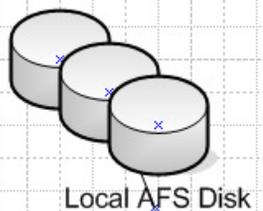
Others...



# Analysis Compute Architecture 2009



## CD - Remote Compute Server



Local AFS Disk



ANSYS Computer Server  
flx11  
(131.225.XXX.XXX)  
64bit OS – LINUX  
8 Gb memory  
xxx Gb Disk  
??K RPM RAID ??  
4 CPU's

2009 Goals
Upgrade to 16 gb memory for compute server
Setup multiple queues for compute server or RSM
with multiple compute nodes
(2) HPC Licenses
(1) ANSYS Geometry Interface for NX

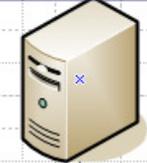
2009 Goals

## PPD



Local Users	Local Users	Local Users
4 ANSYS	3 IDEAS FEA	0 NASTRAN
4 Windows	3 Windows	0 Macintosh
0 Macintosh	0 Macintosh	

## Licensing



ANSYS License Server  
fermi-cadsrv-1  
(131.225.111.55)  
9 ANSYS Licences  
1 MultiPhysics License  
2 HPC Licenses  
5 NASTRAN

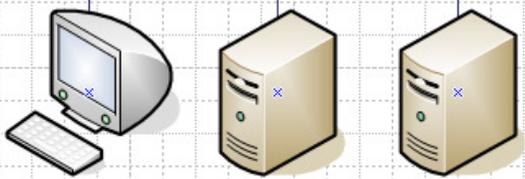
100mb

## TD



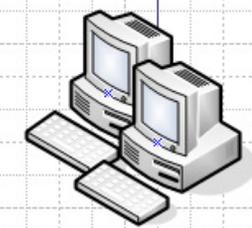
Local Users	Local Users	Local Users
XX ANSYS	2 IDEAS FEA	0 NASTRAN
XX Windows	2 Windows	
0 Macintosh	0 Macintosh	

## ADMS



Local Users	Local Users	Local Users
8 ANSYS	0 IDEAS FEA	0 NASTRAN
4 Windows		
4 Macintosh		

## ADCS



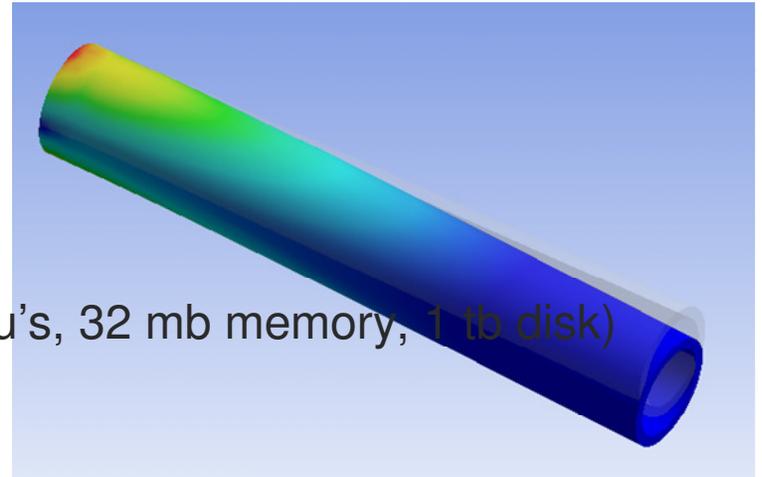
Infrequent ANSYS Users

# Analysis Strategy 2009 to 2011

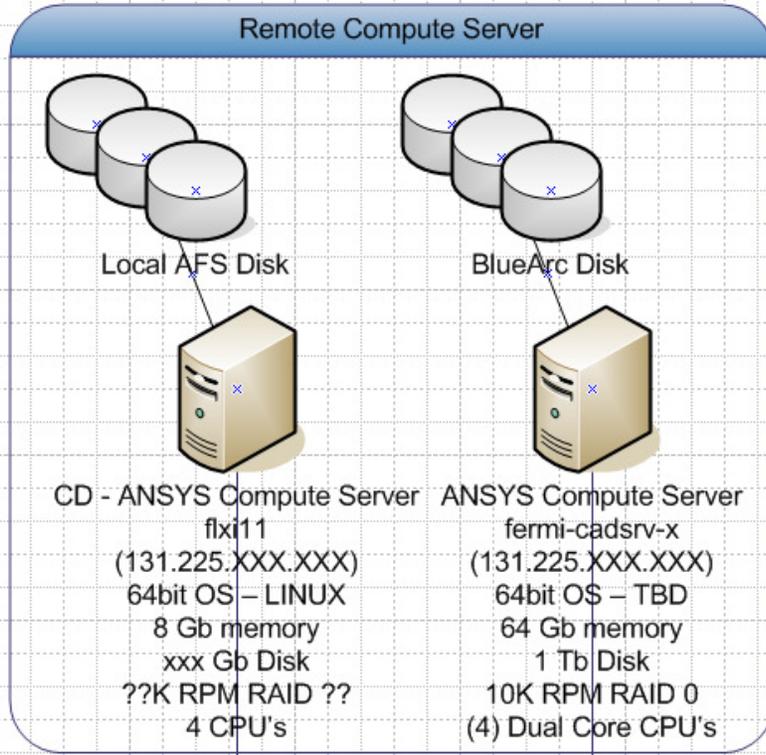
## Goals

2010:

- New Remote Compute Server (8 cpu's, 32 mb memory, 1 tb disk)
- Implement lab wide queue system
- Add 1 ANSYS mechanical license
- Add 2 HPC licenses to run a 6 cpu system
- Add 1 ANSYS Geometry Interface for NX
- Start gb to desktop to analysis users
- Add BlueArc for disk storage
- Summer students – submit to remote compute server only
- Start LS-Dyna investigation

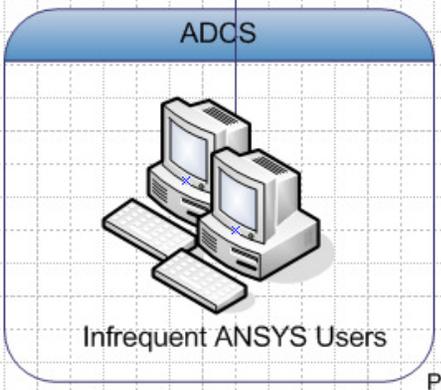
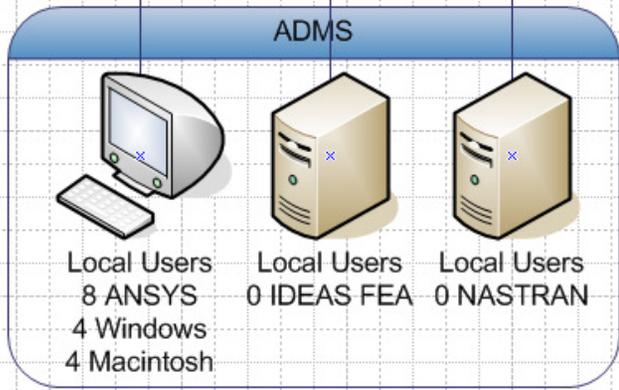
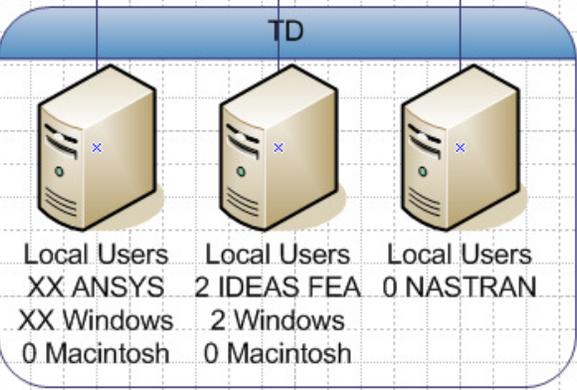
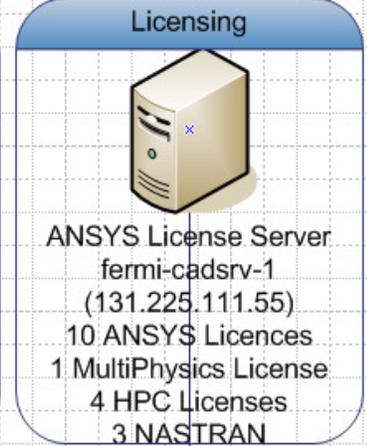
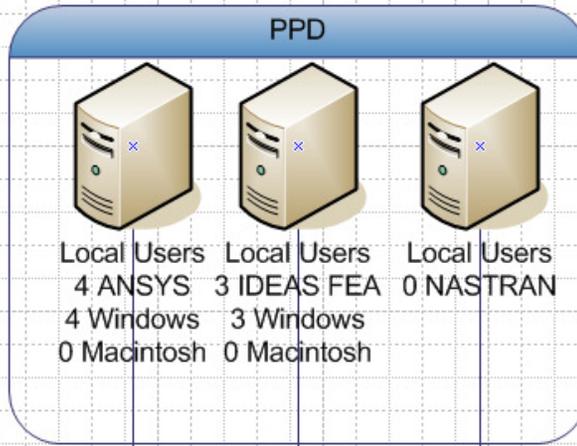


# Analysis Compute Architecture 2010



2010 Goals
New Remote Compute Server
Setup multiple queues for compute server or RSM for multiple compute nodes
(1) mechanical license
(2) HPC Licenses
(1) ANSYS Geometry Interface for NX

2010 Goals
Remove (2) NASTRAN licenses
Start gb to desktop
Add BlueArc disk storage
Transfer all analysis data to BlueArc
Summer Students – Remote Compute Only
Start LS-Dyna Investigation

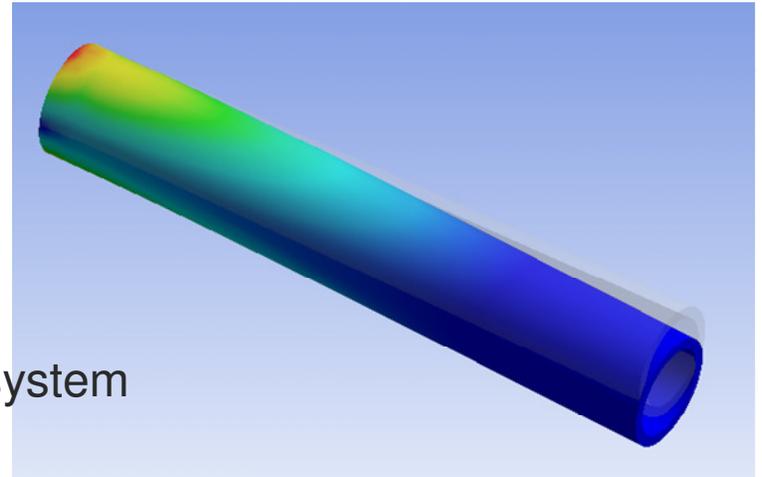


# Analysis Strategy 2009 to 2011

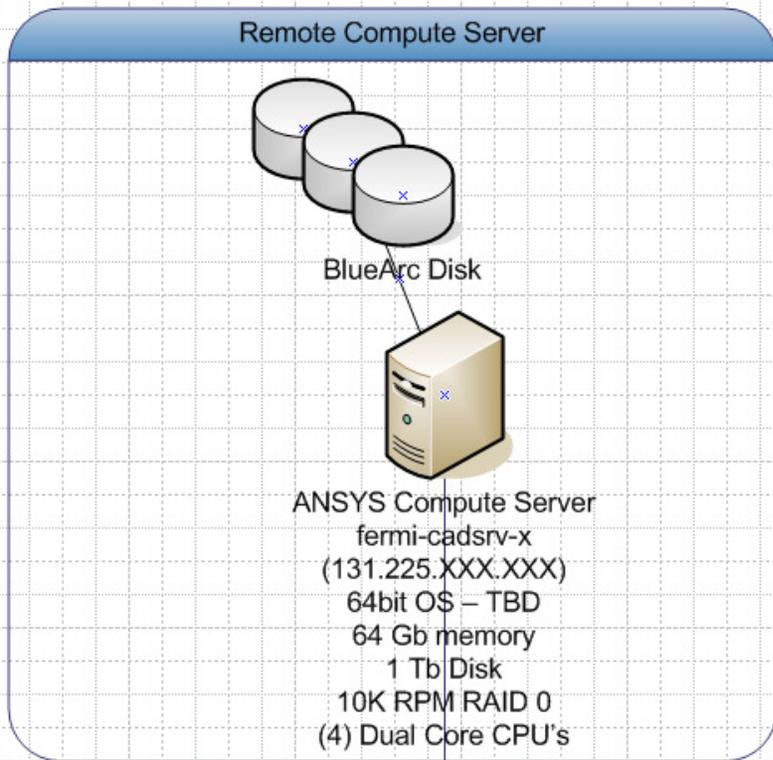
## Goals

2011:

- Add 1 ANSYS mechanical license
- Add 2 HPC licenses to run a 8 cpu system
- Remove X NASTRAN licenses
- Complete gb to desktop to analysis users
- Summer students – submit to remote compute server only
- Complete LS-Dyna investigation
- Remove remote compute access to FNALU cluster

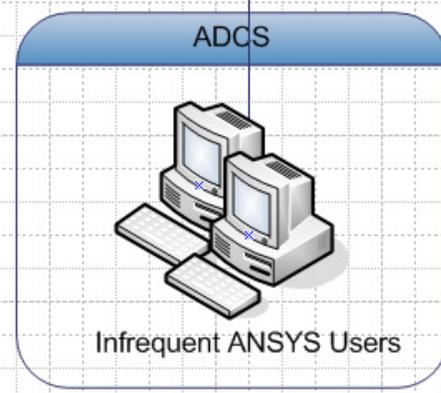
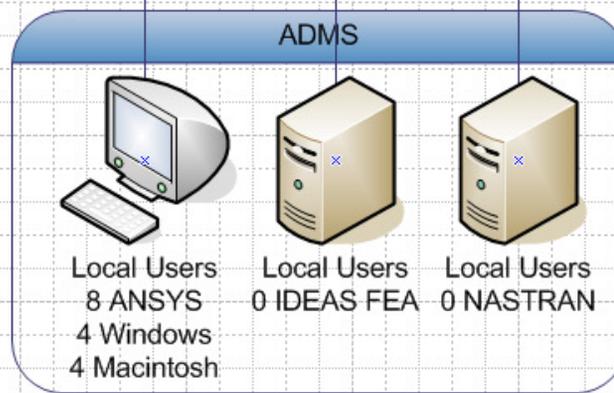
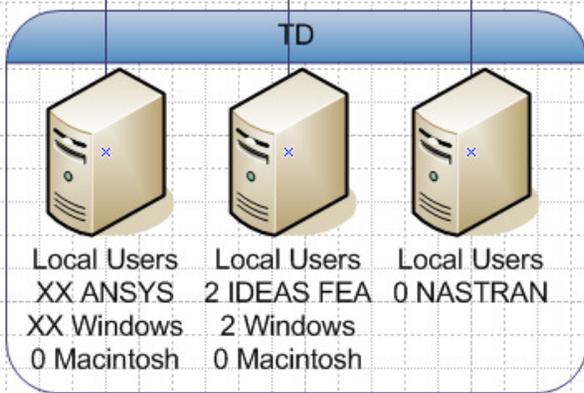
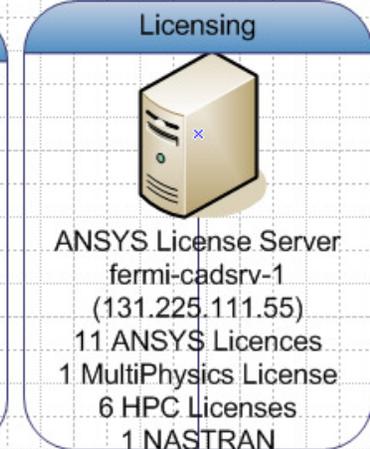
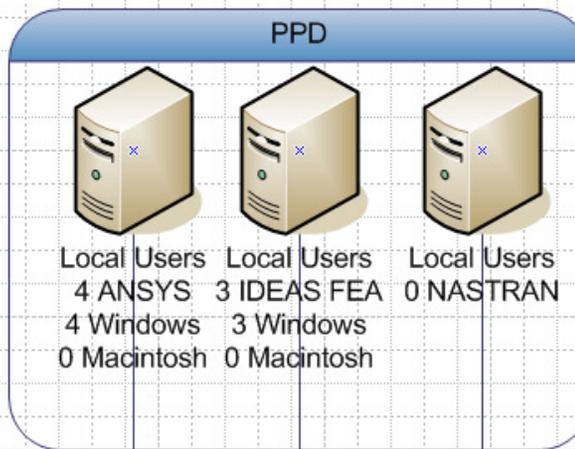


# Analysis Compute Architecture 2011



2011 Goals
(1) mechanical license
(2) HPC Licenses
(1) ANSYS Geometry Interface for NX
Remove (2) NASTRAN license
(1) LS-Dyna – if required

2011 Goals
Complete gb to desktop
Summer Students – Remote Compute Only
Complete LS-Dyna Investigation
Remove access to FNALU Cluster (if using multiple queues)



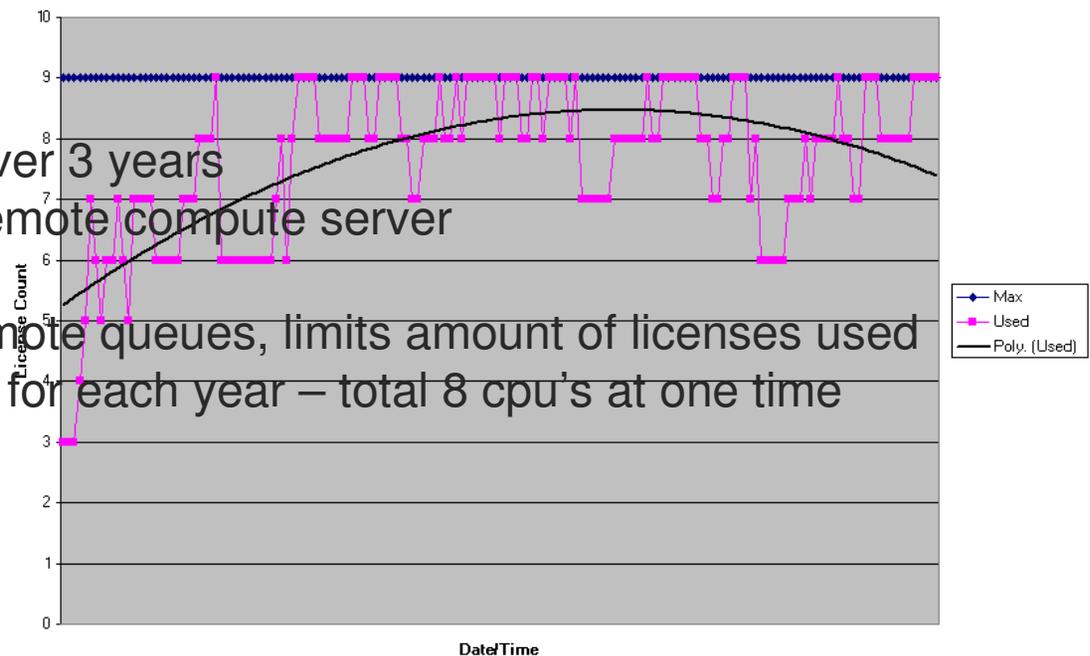
# Analysis Strategy 2009 to 2011

## Licensing

Strategy:

- Add 2 mechanical over 3 years
- Both used for remote compute server
- Summer Students
- All submit to remote queues, limits amount of licenses used
- Add 2 HPC licenses for each year – total 8 cpu's at one time

ANSYS License Usage Week of 20080922



# Analysis Strategy 2009 to 2011

## Remote Compute Server

### Strategy:

- Create business case to replace existing server

  - Local computing issue; personnel inactive when processing

  - Limited model size 4-5 M DOF's (run larger models)

  - Reduce costs at the department level

    - Lower end workstations for local processing (small runs)

    - Summer students access to server minimizes license denials

# Analysis Strategy 2009 to 2011

NX

Strategy:

IDEAS

IDEAS analysis tools switch to ANSYS

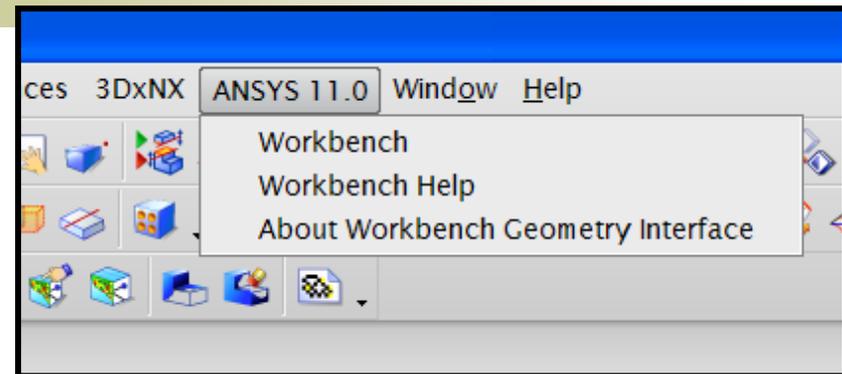
NX

Tools to simplify models (synchronous technology)

Reduce to 1 or 2 NASTRAN licenses for analysis

Add 2 licenses of ANSYS Geometry Interface for NX

Modeling done in NX; alleviate modeling license issue



# Analysis Strategy 2009 to 2011

## Teamcenter

Strategy:

Teamcenter

Configure

Analysis Item

Input files

Db files

Reports

Lab wide consistency for searching, reporting, storage



# Analysis Strategy 2009 to 2011

## Other

### Other Items:

ANSYS users group at Fermilab

1<sup>st</sup> quarter 2009

Wilson Hall

15 minutes from each department on:

People

Types of analysis

Lab Wide Material Properties Database

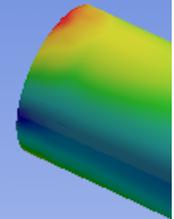
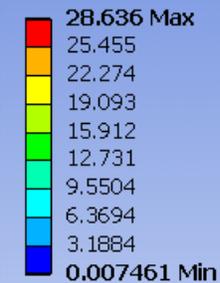
Other analysis tools; NASTRAN, LS-Dyna, COMSOL, ....

Outline for "tube"



### Equivalent Stress

Type: Equivalent (von-Mises) Stress  
Unit: psi  
Time: 1  
10/22/2008 2:16 PM





# Analysis Strategy 2009 to 2011

## Comments and Questions

Comments and Questions: