Rack Server Random Vibration FEA

(Femap w/ NX-Nastran)

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Agenda

- ✓ Rack Server Random Vibration Specification Introduction
- ✓ Rack Level Random Vibration Test
- ✓ Rack Level Random Vibration FEA
- ✓ Automatic Bolt API Sharing

Rack Server Random Vibration Specification Introduction -1

✓ Product Design Experience

Scalable

Performance Driven

Balanced

Rack Server Random Vibration Specification Introduction -2

✓ Transportation

Rail

Air

Truck

Ocean

✓ Specification Introduction

	Customer I	Customer II	Customer III	
Modes	Truck, Air, Rail and Ocean Vibration			
Grms	0.8	1.146	0.84	1.2
Test Orientations	Z	Z	X/Y	Z
Duration (min)	15	60	60	60

Highest Grms

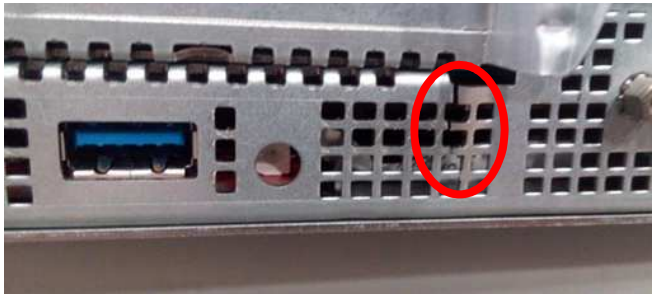
Rack Level Random Vibration Test

✓ **Purpose**: Verify rack server structure rigidity under random vibration input**.**

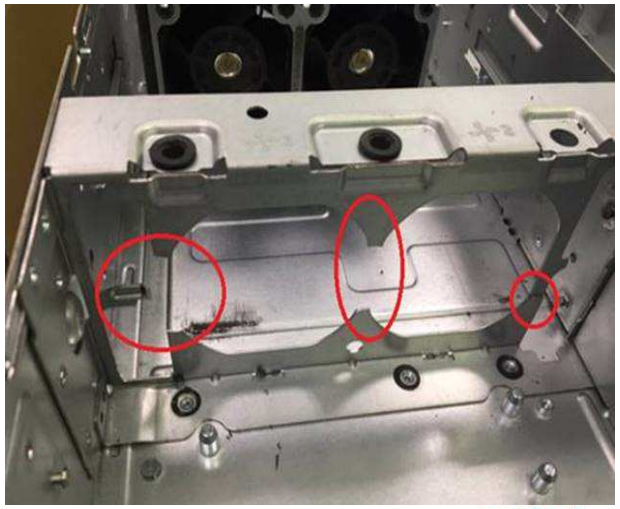
Rack setup on Vibe. table

Testing

Case 1 – 1U rack server test (1.2 Grms) result

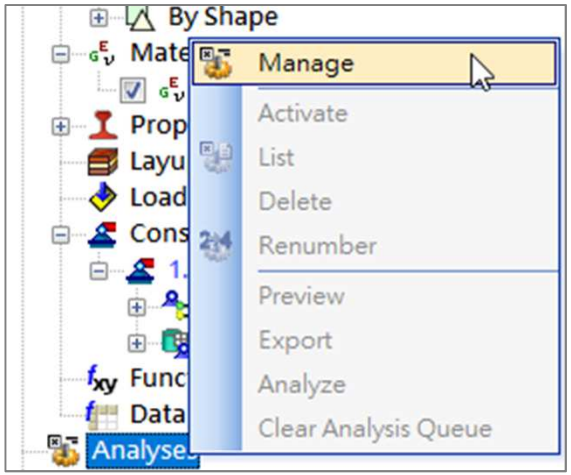


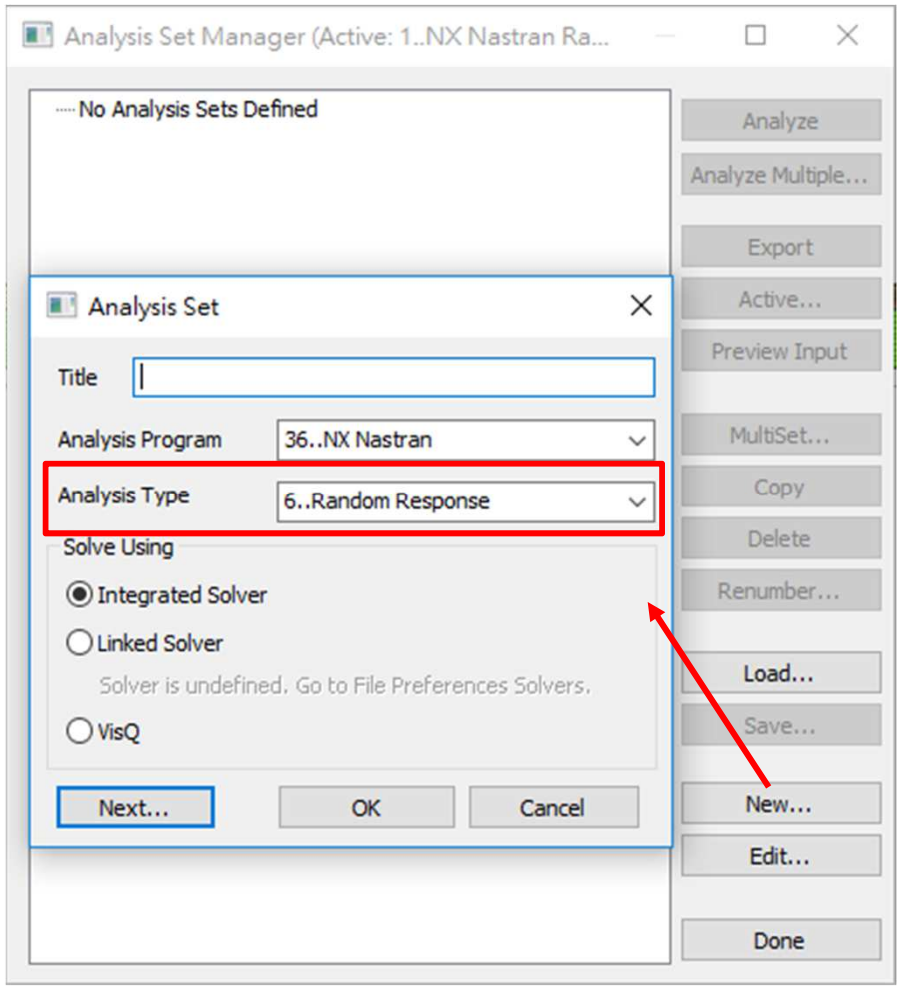
Case 2 – 2U rack server test (1.146 Grms) result



Rack Level Random Vibration FEA

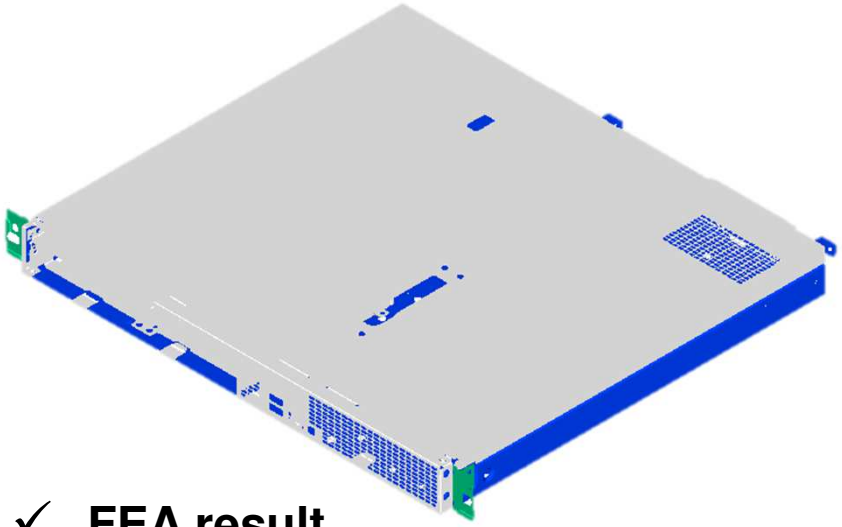
✓ Femap w/ NX-Nastran Random Response Solver





Rack Level Random Vibration FEA – Case 1

✓ **FEA model –** Femap w/ NX-Nastran



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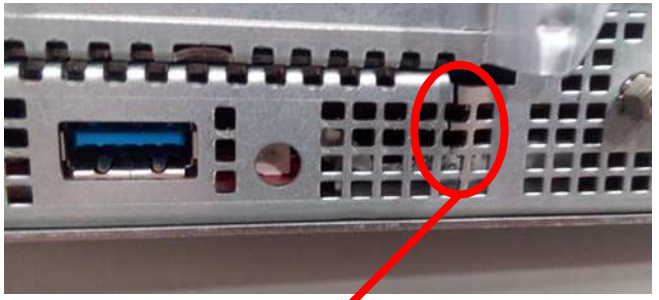
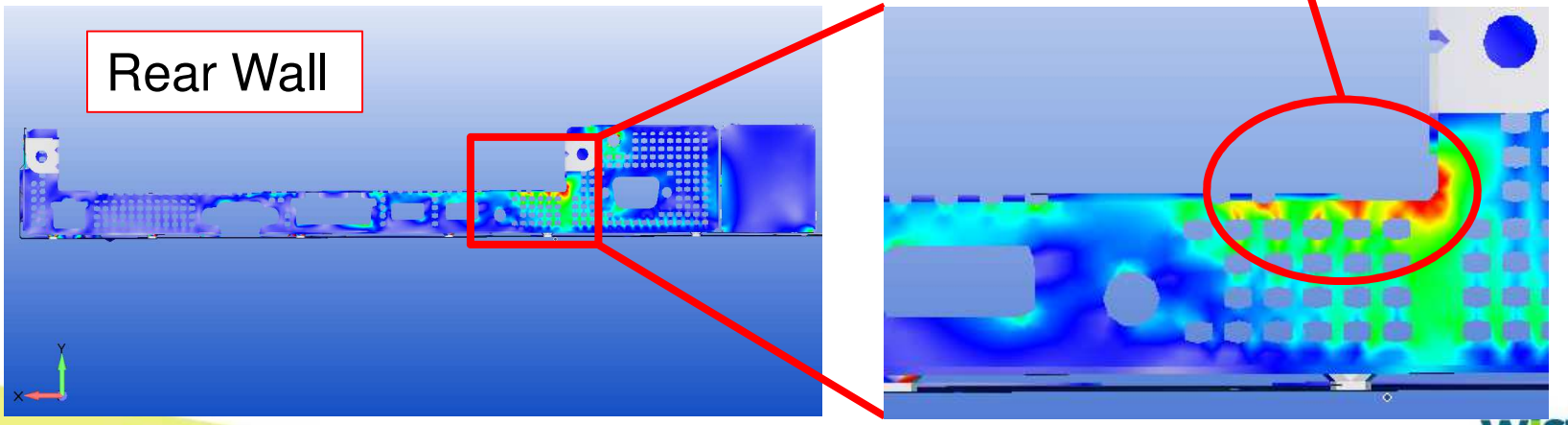


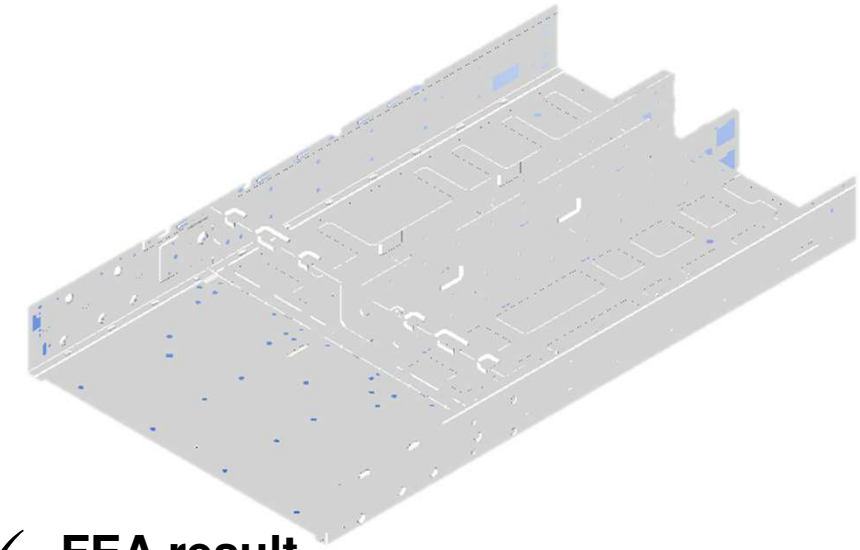
✓ **FEA result**

➢ Stress concentrate on the weak point, FEA result is similar to rack test result.

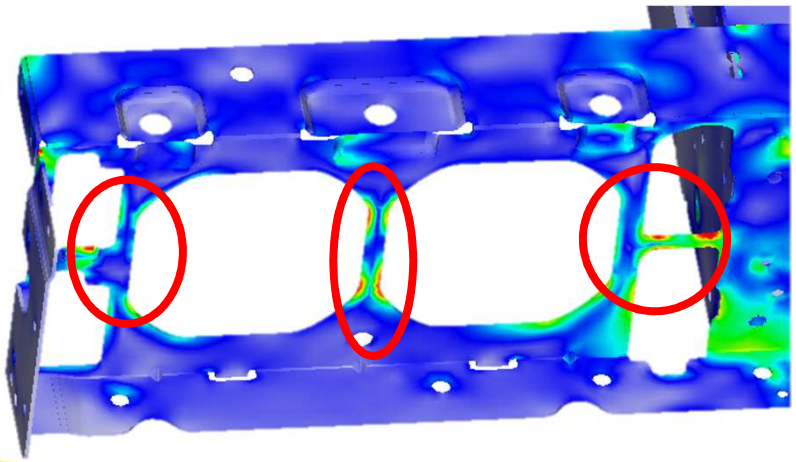


Rack Level Random Vibration FEA – Case 2

✓ **FEA model –** Femap w/ NX-Nastran



✓ **FEA result**



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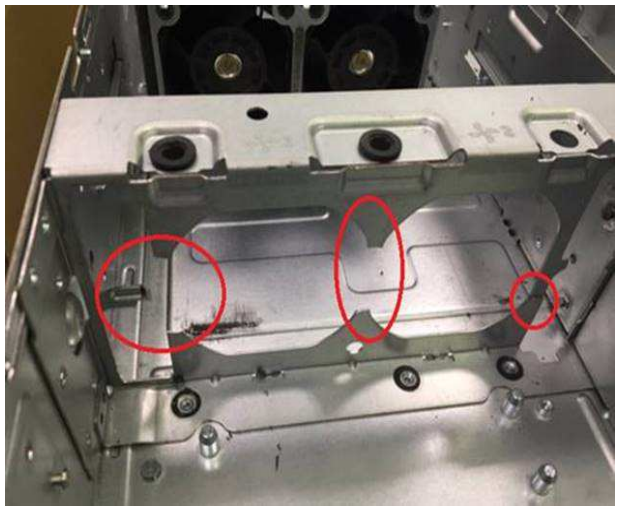
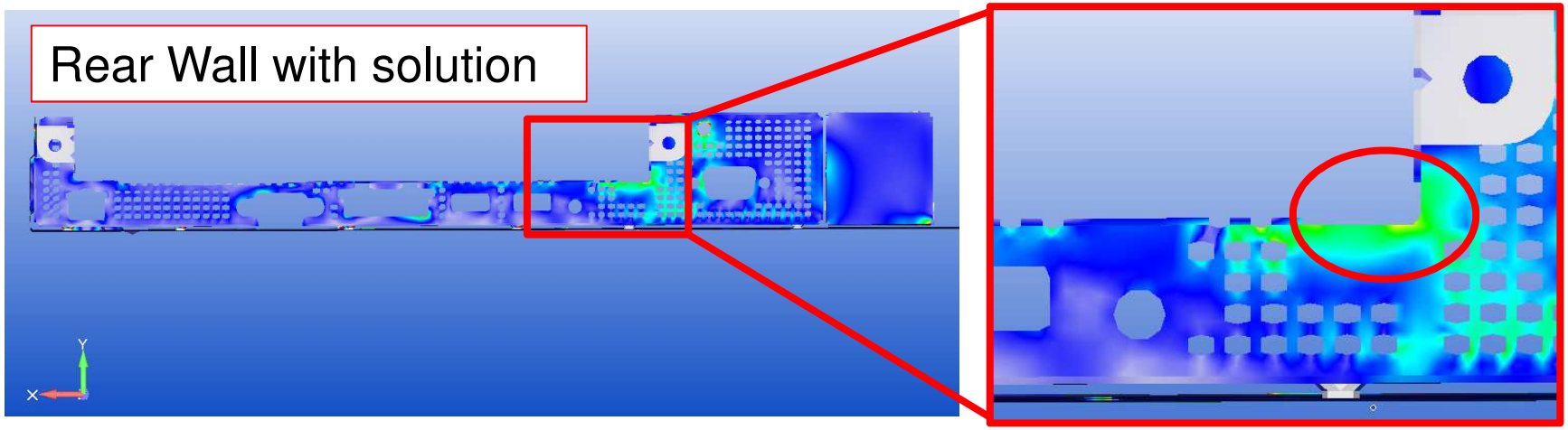


Solution Implement Result

✓ **Case 1**

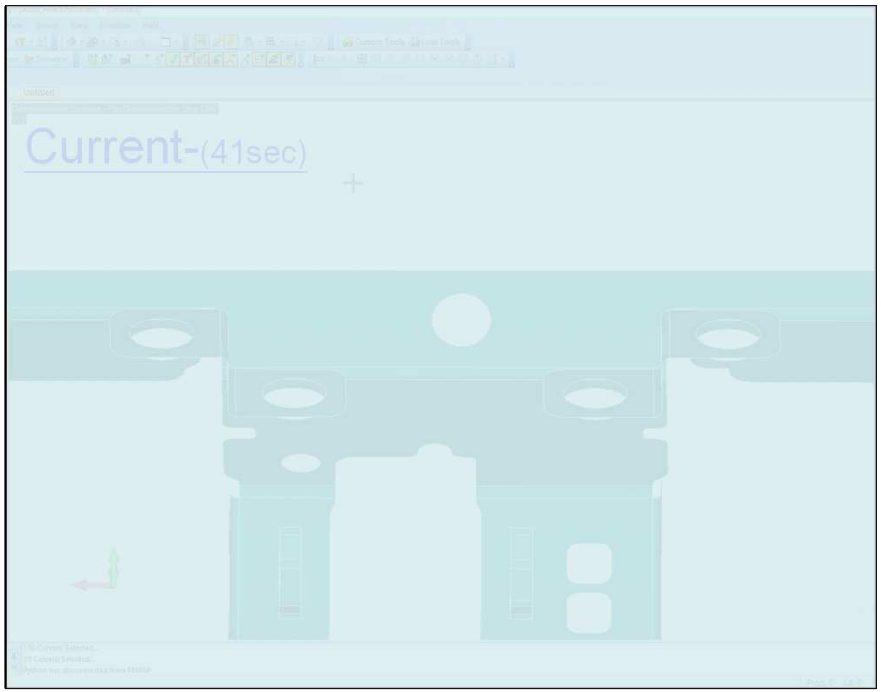


✓ **Case 2**

Backup

Automatic Bolt

✓ *Manual Curve Selection*



✓ *Automatic Select Bolt Circle*

Complete:

1. Select bolt surfaces
2. Enter radius range to search curves on bolted surfaces

Next Action:

3. Automatic search multi-circles which have be bolted together
4. Automatic fixed by each bolted