



# Platform Strategies 2006

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**Platform Technologies**



# Technology Landscape

**64-bit processing and multi-core**



# Technology Landscape

## 64-bit processing

- ▶ 64-bits not new, UGS has supported UNIX (64-bit) for years
- ▶ With 64-bits, think memory addressing and not performance
  - ▶ Pointer size and more data to move
  - ▶ But if your running out of memory, 64-bits is your best choice
  - ▶ Hitting the memory wall will degrade your performance
- ▶ Rule: If do not have memory limit issues (and do not expect to soon) you can stay with 32-bits



# Technology Landscape

## 64-bit hardware

- ▶ For Unix there are proprietary architectures
  - ▶ SPARC (Sun), Power (IBM) and PA-RISC/Itanium (HP)
- ▶ For Windows/Linux you have x86-64
  - ▶ Also identified as: x64, EM64T(Intel) or Opteron (AMD)
- ▶ Workstations are all moving 64-bit
  - ▶ Hard to find a 32-bit WS
  - ▶ All new WS certified from our HW partners are 64-bit
- ▶ Should see 64-bit mainstream Laptops late this year or early next



# Technology Landscape

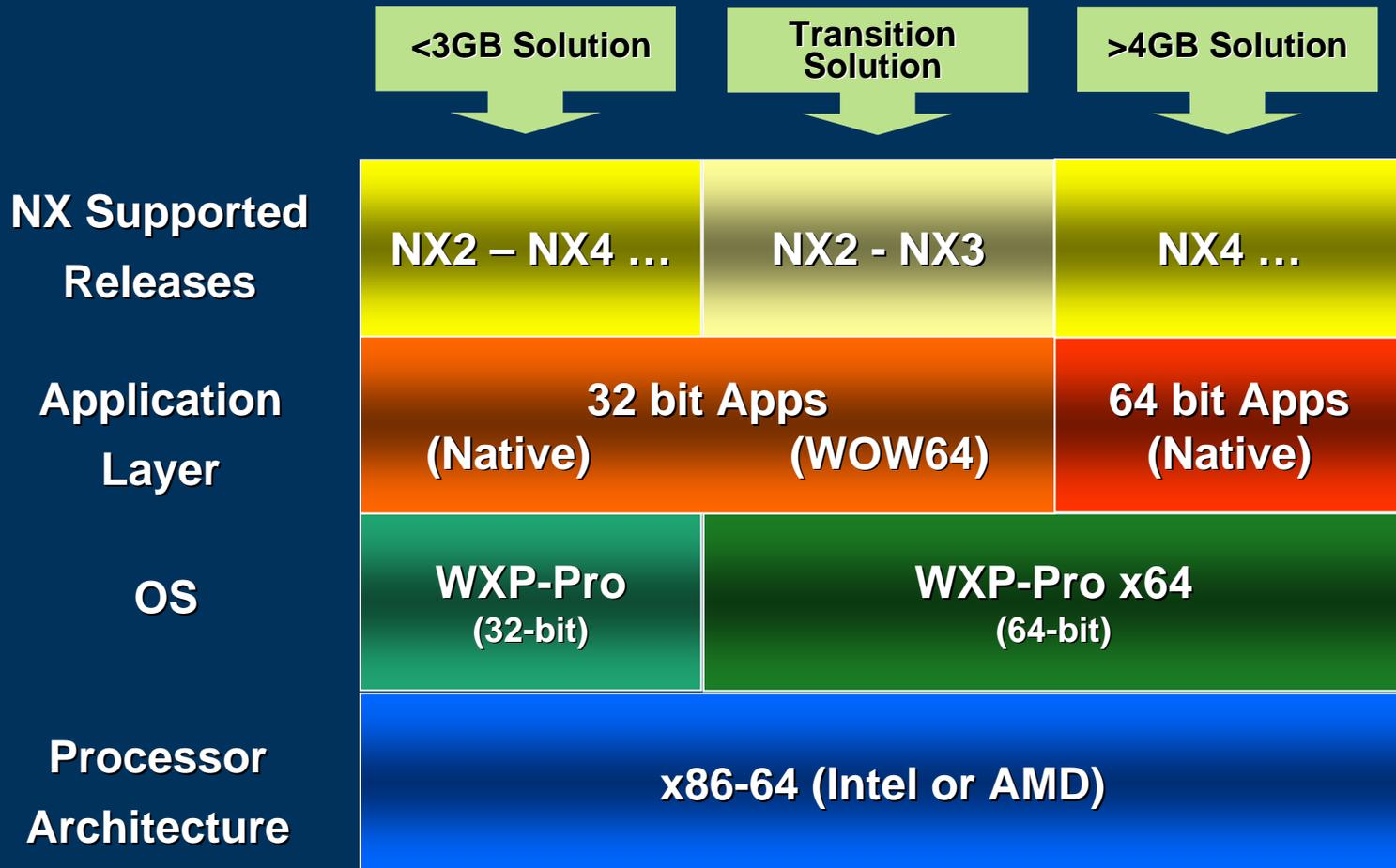
## 64-bit Operating Systems

- ▶ Unix systems are 64-bit
  - ▶ UGS supports 64-bit depending on application
- ▶ Linux distributions are 64-bit
  - ▶ UGS direction is 64-bit although a few products have 32-bit support
- ▶ Windows is now 64-bit
  - ▶ Most UGS products are still 32-bit but a moving to 64-bits as required by the application
  - ▶ NX and TC Visualization view 64-bits as a requirement



# Technology Landscape

## Understanding x86-64 Windows Choices





# Technology Landscape

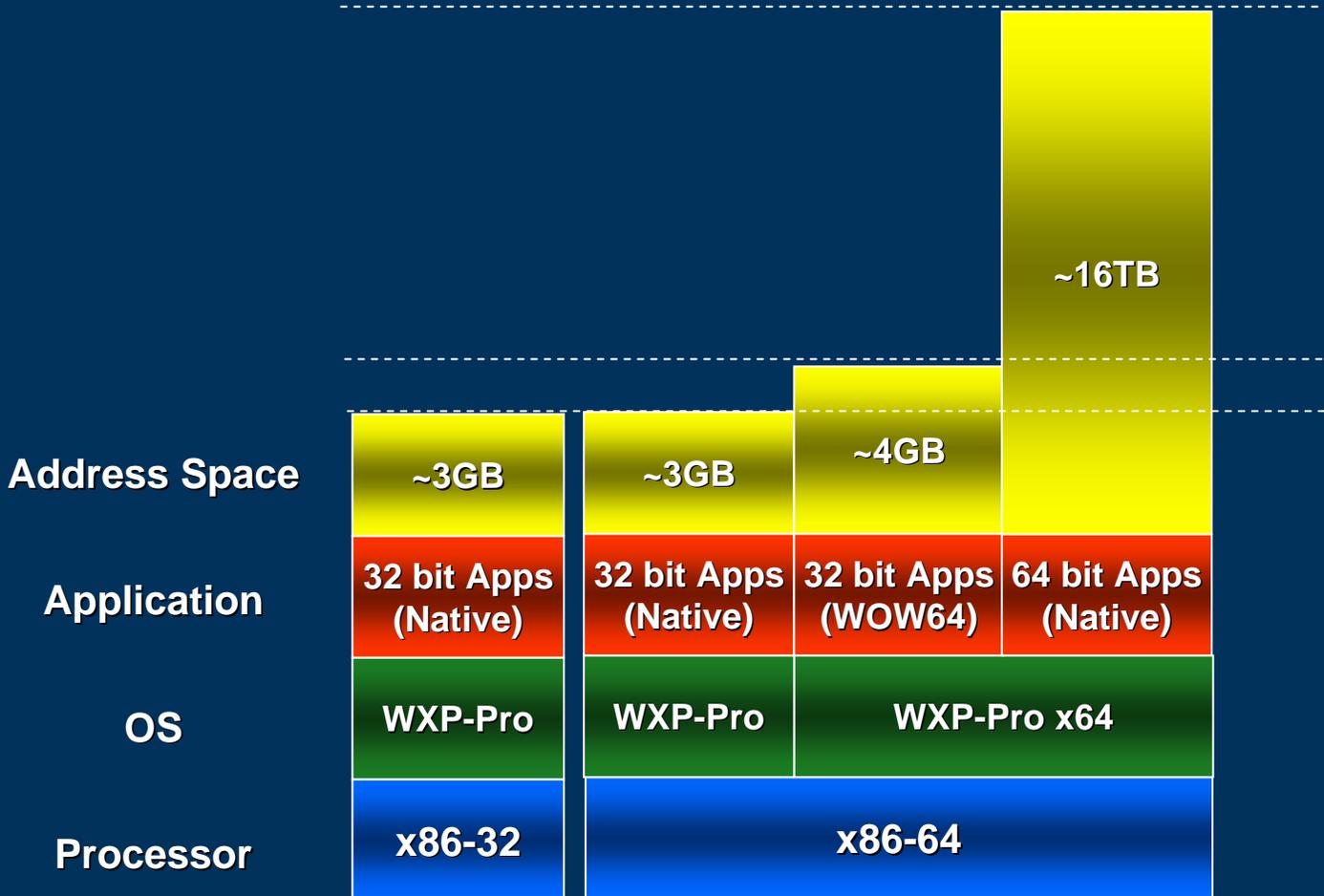
## Windows Memory and CPU Limits

General Memory Limits	32-bit	64-bit
Total Virtual Address Space	4 GB	16 TB
Virtual Address Space per 32-bit process	2GB (3 GB if system is booted with /3gb switch)	4GB if compiled with /LARGEADDRESSAWARE 2GB otherwise
Virtual Address Space per 64-bit process	Not applicable	8 TB
Paged Pool	470 MB	128 GB
Non-Paged Pool	256 MB	128 GB
System Cache	1 GB	1 TB
Physical Memory and CPU Limits	32-bit	64-bit
Windows XP Professional	4 GB / 1-2 CPUs	128 GB / 1-2 CPUs
Windows Server 2003 Standard Edition	4 GB / 1-4 CPUs	32 GB / 1-4 CPUs
Windows Server 2003 Enterprise Edition	64 GB / 1-8 CPUs	1 TB / 1-8 CPUs
Windows Server 2003 Datacenter Edition	64 GB / 1-32 CPUs	1 TB / 1-64 CPUs



# Technology Landscape

## Memory Addressing Considerations





# Technology Landscape

64-bit processing and **multi-core**



# Technology Landscape

## Multi-core processors

- ▶ Processor technology driven by Moore's law
  - ▶ What Moore really said was number of **transistors** per square inch on **integrated circuits** had doubled every year since the integrated circuit was invented
  - ▶ Problem is that to do this requires more transistors per die (chip) pushing complexity, cost and heat
- ▶ One answer is multi-core
  - ▶ Multi-core chips can have lower processor speed which slows the complexity push, easing cost and lowering heat while increasing “performance”



# Technology Landscape

## Multi-core processors

- ▶ Multi-cores sound good and look good in benchmarks but you need to have your application designed to take advantage
- ▶ Most software today is designed for SP, not MP
- ▶ As hardware vendors clock back on processor speed in favor of “more cores” you will not see the amazing performance gains these benchmarks display
- ▶ In time, Multi-core will benefit everyone but today that is not the case



# Technology Landscape

## RISC

(Sun, HP, IBM)

- ▶ Proprietary technology
- ▶ HP PA-RISC and Sun's SPARC no longer technology leaders
- ▶ Limited desktop focus, still good server solution



RISC

## IPF

(Itanium Processor Family)

- ▶ Designed for 64-bit with limited legacy 32-bit support
- ▶ Limited acceptance by major vendors (HP and SGI)
- ▶ Servers only



IPF

## x86-64

(x86 with 64-bit Extensions)

- ▶ Supports legacy 32-bit or newer 64-bit applications at the same time
- ▶ Great 32-bit to 64-bit migration path
- ▶ Best price performance
- ▶ Server or desktop
- ▶ Available from all major vendors



AMD-64



EM64T



# Technology Landscape

## UGS Desktop Position



- ▶ Linux/x64 and Windows/x64 offers:
  - ▶ Best price performance
  - ▶ Large choice of vendors
    - ▶ Dell, Fujitsu-Siemens, HP, IBM and Sun
  - ▶ Supports latest UGS 64-bit products as well as UGS and other legacy 32-bit products on single platform
  - ▶ Greatest choice of available applications
  - ▶ Offers long term stability, capabilities and performance



# UGS Directions

## Linux



## Supported Distribution

- ▶ Novell SUSE is the Linux distribution supported by UGS LINUX products
  - ▶ Novell SUSE Enterprise Server (SLES) 9 SP2
  - ▶ Novell SUSE Desktop (NLD) 9 SP2
    - ▶ Both based on Linux 6.2 kernel
  - ▶ Other SUSE versions (like Professional are NOT SUPPORTED)
- ▶ Some UGS applications support additional distributions as determined by their market and customer requirements
  - ▶ NX Nastran and Parasolid already support Red Hat

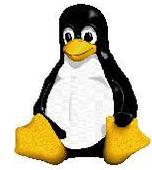


## Hardware Platforms

- ▶ The UGS Linux platform is x86-64 and 64-bit
  - ▶ Products not already supporting 32-bit Linux will be 64-bit only
    - ▶ NX, TC Engineering, TC Enterprise and TC Visualization
  - ▶ Intel EM64T and AMD x64 processors
    - ▶ Dell, HP, IBM, FSC and Sun
  - ▶ No SMP support in NX yet but will be at a future release
  - ▶ Some products will support other hardware platforms and distributions as required by their market needs
    - ▶ NX Nastran



# UGS Linux Product Overview



## Novell SUSE UGS Positioning

- ▶ NX Nastran – Shipping
- ▶ NX – Shipping
- ▶ TC Visualization – Shipping
- ▶ TC Engineering and Enterprise – Shipping 2H06
- ▶ All 64-bit Native applications
- ▶ Issues/Concerns
  - ▶ Availability of 3<sup>rd</sup> party applications
  - ▶ Desktop productivity tools
  - ▶ Maturity of Linux as high-end 3D Desktop OS



# UGS Directions

**Move to 64-bit Windows**



# Windows x64 Product Roadmap

## x64 Terminology

- ▶ x86-64 is 64-bit enabled hardware, also known as x64 EM64T (Intel) or Opteron (AMD)
- ▶ WXP x64 is Microsoft's 64-bit version of Windows
  - ▶ Not to be confused with the defunct version for Itanium
- ▶ x64 hardware can run either 32-bit OS or 64-bit OS
  - ▶ WXP Pro or WXP Pro x64
- ▶ WXP x64 can run 32-bit applications as well as 64-bit applications



# Windows x64 Product Roadmap

## x64 Terminology

- ▶ So when we talk about 64-bit Windows we could mean...
  - ▶ 64-bit hardware running 32-bit OS and 32-bit application
    - ▶ x64 / WXP / NX3
  - ▶ 64-bit hardware running 64-bit OS and 32-bit application
    - ▶ x64 / WXP x64 / NX3
  - ▶ 64-bit hardware running 64-bit OS and 64-bit application
    - ▶ x64 / WXP x64 / NX4



# Windows x64 Product Roadmap

## UGS Position (32-bit applications)

- ▶ WXP (32-bit) is supported on x64 hardware the same as with older x86 hardware
- ▶ WXP x64 is supported on x64 hardware:
  - ▶ For NX2, Certified for NX 2.0.6 or higher
  - ▶ For NX3, Certified for NX 3.0.2.3 or higher
  - ▶ For NX4, Supported as Native 64-bits only
  - ▶ TC products are work in progress
- ▶ WOW64, sophisticated implementation but not without issues



# Windows x64 Product Roadmap

## UGS Position (64-bit applications)

- ▶ Native 64-bit support for  and 
- ▶ NX4 and TC Vis 2005 SR1 only
- ▶ NX4 has two versions, 32-bit version supported only on WXP (32-bit OS) and a 64-bit version only supported on WXP x64
- ▶ Other TC products still 32-bit



# UGS Directions

## Platforms by Product



Thank You