

Powering high-end x86 systems

vSMP Foundation 2.0 Announcement

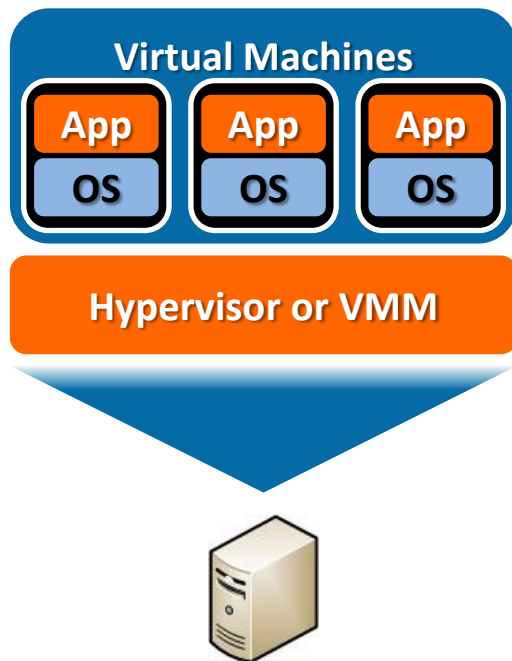
vSMP Foundation – Background

NEW SERVER VIRTUALIZATION PARADIGM

ENTERPRISE APPLICATIONS

Applications requiring **fraction** of the physical server resources

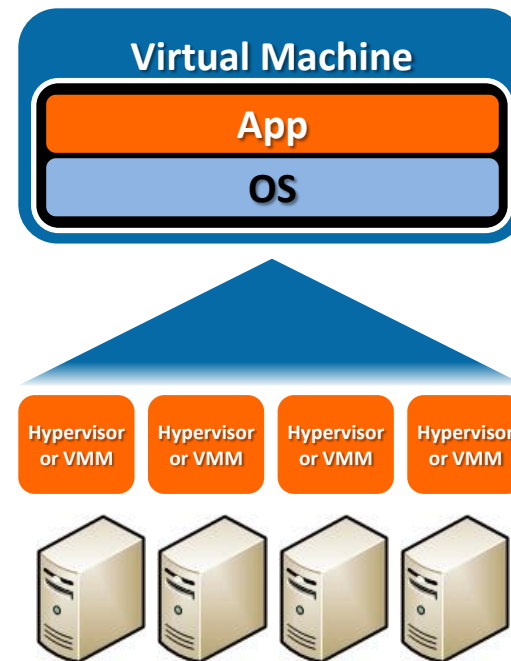
Existing: Partitioning



HIGH PERFORMANCE COMPUTING

Applications requiring **superset** of the physical server resources

New: Aggregation



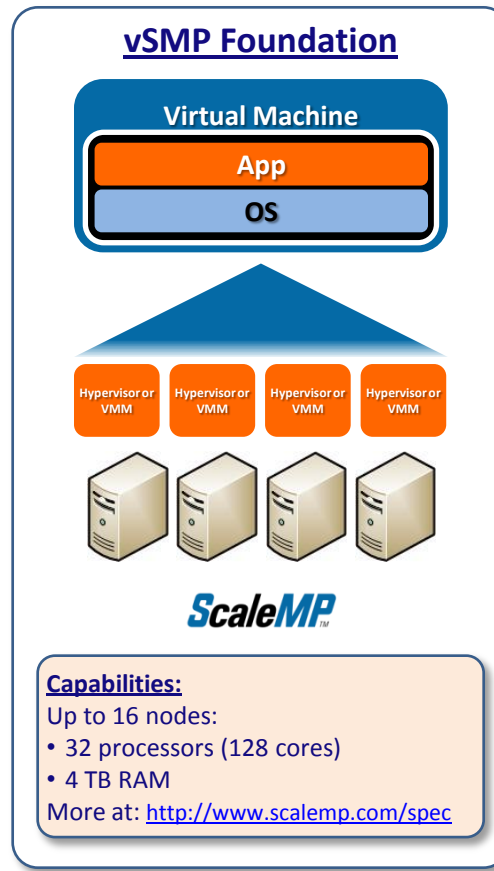
vSMP Foundation – Background

THE NEED FOR AGGREGATION - TYPICAL USE CASES



Cluster Management

- Requirements driven by IT to simplify cluster deployment:
 - Single OS
 - InfiniBand complexity removal
 - Simplified I/O: faster scratch storage
 - Large memory is a plus
- OPEX savings



SMP Replacement

- Requirements driven by the end users per application characteristics:
 - Large memory
 - High core-count
 - IT simplification is a plus
- CAPEX savings

vSMP Foundation 2.0

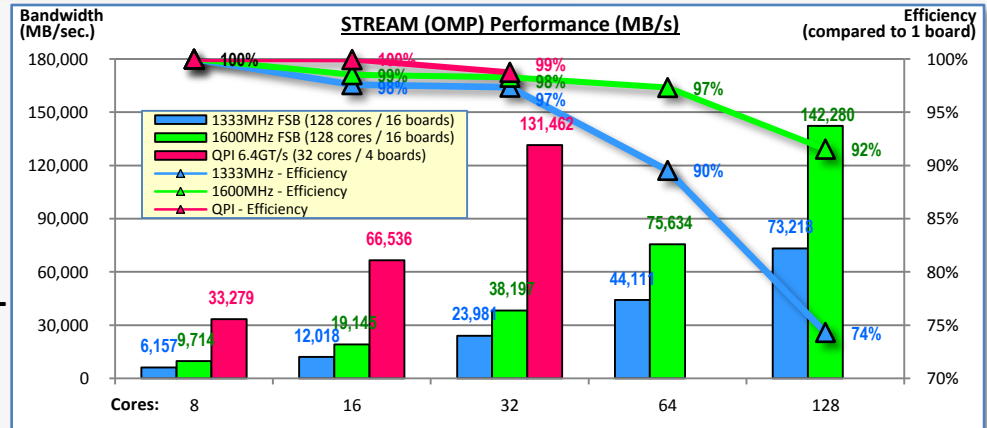
Enhanced performance and enterprise-class features



vSMP Foundation 2.0 – Details

Support for Intel® Nehalem Processor Family

- First Nehalem solution with more than 2 processors
- Up to 3 times better performance
- Optimized performance with intra-board memory placement and QDR InfiniBand



High-availability

Partitioning

Support for Emulex LightPulse® Fibre-Channel (FC) HBAs

Remote Management

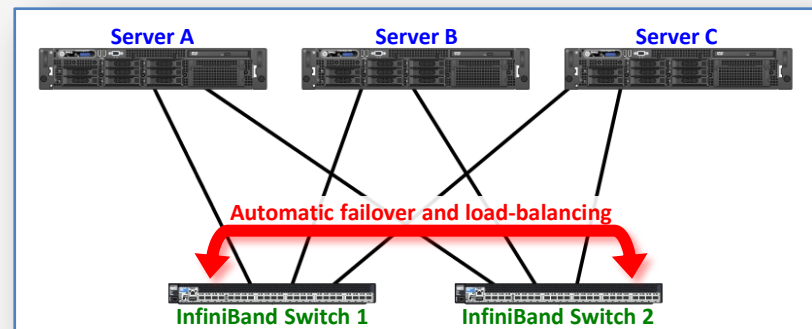
Profiling Subsystem

vSMP Foundation 2.0 – Details

Support for Intel® Nehalem Processor Family

High-availability

- 2 InfiniBand switches (dual-rail) in an active-active configuration
- Automatic failover on link errors (cable) or switch failure
- Improved performance with switch load-balancing (both switches used in parallel)



Partitioning

Support for Emulex LightPulse® Fibre-Channel (FC) HBAs

Remote Management

Profiling Subsystem

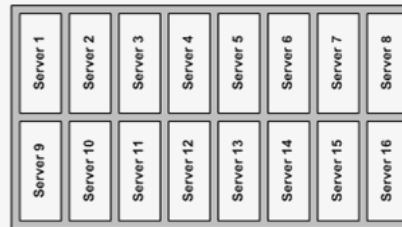
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Support for Intel® Nehalem Processor Family

High-availability

Partitioning

- Create isolated hardware-level partitions, each can run different OS
- Up to 8 partitions, minimum 2 servers per partition
- Requires add-on license



Single Partition



Multiple Partitions

Support for Emulex LightPulse® Fibre-Channel (FC) HBAs

Remote Management

Profiling Subsystem

vSMP Foundation 2.0 – Details

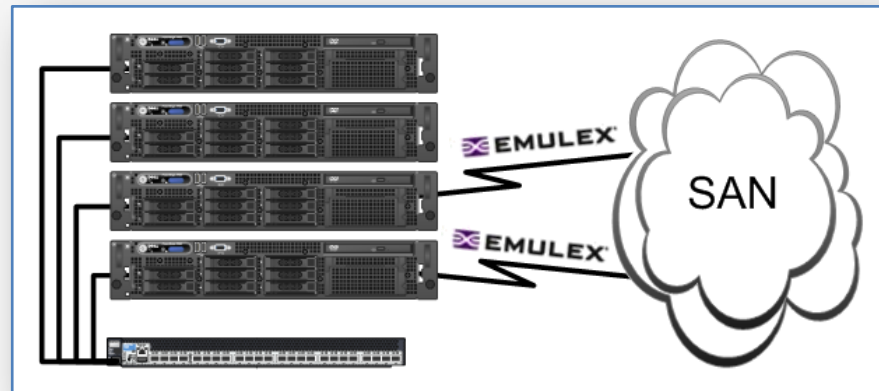
Support for Intel® Nehalem Processor Family

High-availability

Partitioning

Support for Emulex LightPulse® Fibre-Channel (FC) HBAs

- Up to 2 Emulex LightPulse® Fibre-Channel (FC) HBAs per server
- Up to 32 HBAs for virtual machine
- Significantly improves cluster IO capabilities, while keeping cost low



Remote Management

Profiling Subsystem

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Remote Management

- Serial console for all vSMP Foundation control and monitoring operations
- Augments existing VGA-based control



Profiling Subsystem

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Profiling Subsystem

- Full stack profiler allows identification of code scalability inefficiencies
- Zoom to line of code, providing insight about cross-node memory usage, I/O access and interrupts
- Open API, allowing integration with 3rd party tools



Target Environments and Applications

Target Environments

- Users seeking to simplify cluster complexities
- Applications that use large memory footprint (even with one processor)
- Applications that need multiple processors and shared memory

Typical end-user applications

Manufacturing

CSM (Computational Structural Mechanics)
ABAQUS/Explicit
ABAQUS/Standard
ANSYS Mechanical
LSTC LS-DYNA
ALTAIR Radioss

CFD (Computational Fluid Dynamics)
FLUENT
ANSYS CFX
STAR-CD
AVL FIRE
Tgrid

Other
inTrace OpenRT

Life Sciences

Gaussian
VASP
AMBER
Schrödinger Jaguar
Schrödinger Glide
NAMD
DOCK
GAMESS
GOLD
mpiBLAST
GROMACS
MOLPRO
OpenEye FRED
OpenEye OMEGA
SCM ADF
HMMER

Energy

Schlumberger ECLIPSE
Paradigm GeoDepth
3DGEO 3DPSDM
Norsar 3D

EDA

Mentor
Cadence

Finance

Wombat
KX

Others

The MathWorks MATLAB
R
Octave
Wolfram MATHEMATICA
ISC STAR-P

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