오픈기반 컴퓨팅을 위한 인프라 아키텍쳐 재구성 전략

이성호
기술담당/Enterprise Solution Sales
인텔코리아

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Look Inside.™

IT: 혁신의 시간

'90년대 까지
컴퓨터 중심

2000년대
네트워크 중심

오늘날
인간 중심

자동화를 통한
생산성에
주안점

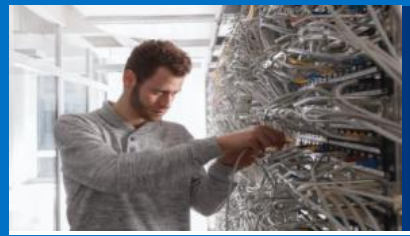
연결성을 통한
비용 절감에
중점

클라우드와 디바이스를 통한
신속한 서비스 제공에
중점

제약이 많은 현재의 인프라

서버
평균 사용율 – 가상화에도 불구하고 50% 미만[4]

스토리지
연평균 데이터 증가율 40%, 그중 90%는 비정형데이터[3]



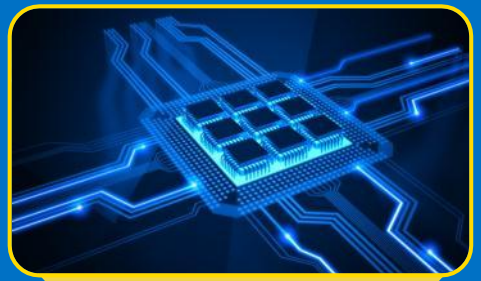
네트워크
신규서비스 제공에 2-3주 소요[1]
연평균 모바일 데이터 트래픽 증가율 66%[2]

1: Source: Intel IT internal estimate
2: Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2012–2017
3: IDC's Digital Universe Study, sponsored by EMC, December 2012
4: IDC Server Virtualization and The Cloud 2012

소프트웨어 정의(Software Defined) 인프라

고정형에서 동적으로, 수작업에서 자동화로

서버



스토리지

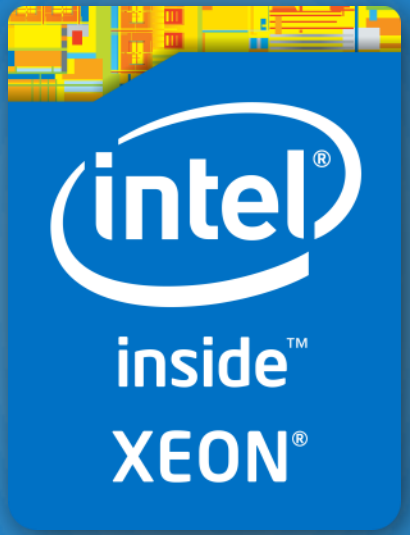
네트워크

모두 공통적이고, 확장가능하고, 효율적인
아키텍쳐상에 구축됨

차세대
Intel® Xeon® 프로세서
E5 v2 제품군

민첩하고,
에너지 효율이 뛰어난
데이터센터의 핵심

인텔® 제온® E5 2600 v2 제품군



최대 50% 더 높은 성능[1]
최대 12개의 코어 및 30 MB 내부캐시

최대 45%의 에너지 효율 향상[2]
22nm 공정 기술

향상된 보안 기능
Intel® Data Protection 기술

[1] SPECvirt_sc2013*: E5-2690 platform, 256GB, score: 624.9@37VMs, baseline source. IBM* System x3650 M4, E5-2697 v2, 512GB, score 947.9@53 VMs.
[2] SPECpower_ssj2008*: E5-2660 platform, 16GB, score 5,544, baseline source. Fujitsu* PRIMERGY RX300 S8, E5-2660 v2, 48GB, score 8,097.
Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to http://www.intel.com/performance Intel does not control or audit the design or implementation of third party benchmark data or Web sites referenced in this document. Intel encourages all of its customers to visit the referenced Web sites or others where similar performance benchmark data are reported and confirm whether the referenced benchmark data are accurate and reflect performance of systems available for purchase. *Other names and brands may be claimed as the property of others.

모든 유형의 작업부하에 탁월한 퍼포먼스 신기록

15 World Record Publications

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서버 혁신:

4%의 전력 및 2% 의 비용[1]으로 91% 수준의 성능 구현

2008

64 소캣 Fujitsu SPARC Enterprise M9000*

40,000W[2]

~$1M[3]

2013

인텔® 제온® 프로세서 E5 2697 v2 기반 시스템 2대

1,500W[2]

~$20K[3]

1.Comparison of Intel® C606 Chipset-based server using two Intel® Xeon® processors E5-2697 v2 (codenamed "Ivy Bridge", 30M Cache, 2.70 GHz, 8.00 GT/s Intel® QPI, 10-cores/chip), Intel Compiler 13.1 AVX-compiled binaries, 8x 16GB DR DDR3-1866 DIMMs, Red Hat* Enterprise LINUX Server 6.3. Baseline estimated score 911. Source: Intel SSG Technical Report 1363; Fujitsu SPARC Enterprise M9000 Fujitsu SPARC Enterprise M9000 using 64 SPARC64 VII processors (6M Cache, 2.52 GHz, 4-cores/chip), Sun Studio 12, Solaris 10. Baseline score 2090. Source: www.spec.org/cpu2006/results/res2008q3/cpu2006-20080711-04737.html

2.Power figures based on listed specifications of M900 system per Fujitsu and a representative Xeon based platform from Dell the R720

3.SPRAC M9000 data per IDC worldwide Quarterly Server Tracker – 2012 Q3 and Xeon E5 based system based on Intel internal estimate of expected OEM system price

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서버 및 워크스테이션

inspur 浪潮

Milkyway-2:
밀도의 혁신을 보여주는 top 500 리스트의 #1 수퍼컴퓨터

Mac Pro:
이전 세대 대비 최대 2.5배의 성능향상 및 뛰어난 IO 확장성

acer ASUS BULL CRAY THE SUPERCOMPUTER COMPANY
CISCO DELL FUJITSU
HITACHI Inspire the Next Hitachi Data Systems hp HUAWEI IBM
lenovo NEC ORACLE
Quanta Optimize Your Datacenter sgi 中科曙光 Sugon SUPERMICRO
TYAN wiwynn UNISYS

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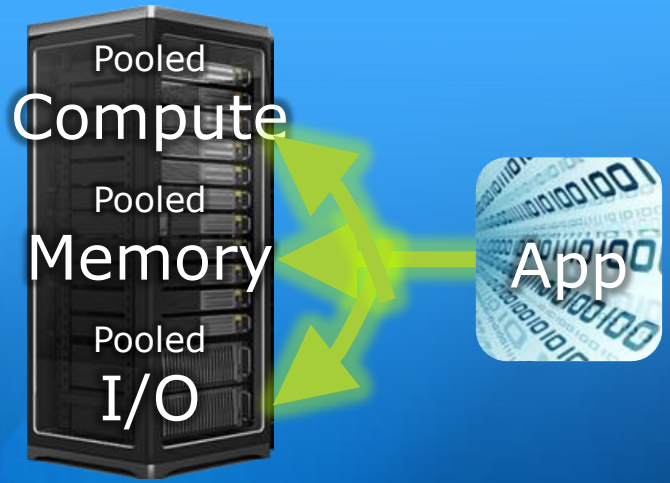
랙 수준의 서버 아케텍쳐의 재구성

현재

애플리케이션이 "박스내"의 리소스에 제약을 받음

미래:
조합가능한 리소스



애플리케이션 중심의 리소스 할당으로 더욱 큰 효율 제공

스토리지 혁신:
제온®으로 데이타 증가를 관리

18개
기업용 데이터의 평균 사본 수[1]

제온의 인라인 중복제거 기능

최대
2.2배
해싱 알고리즘 성능[2]

최대
3.5배
I/O 대역폭 향상[3]

1: 2013 IBM edge presentation by Ed Walsh
2: Source: Internal measurements on of 2S E5-2680 v2 2.70Ghz/1600Mhz 64GB DRAM) and Intel® Server Board S5520HC (2S EP X5680 (Westmere) 3.33GHz/1600MHz 48GB DRAM). Based on sha1 multi-buffer hash function from v2.7 of the Intel® ISA-L library and use of 25% of available cores on each system
3: Internal measurements using 2S Xeon® E5-2600 based platform vs. 2S Xeon® X5600 based platform with 4x8 PCIe lanes per platform, 50/50 read/write traffic

스토리지 아키텍쳐의 재구성
소프트웨어 기반 스토리지

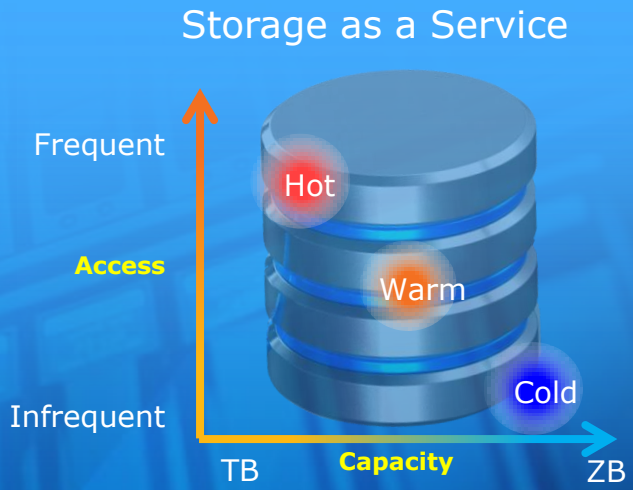
기존의 스토리지

공유 데이터용량

고성능

뛰어난 데이터 보호기능

미래의 스토리지



다양한 최적화된 솔루션

애플리케이션 위주로 구성

뛰어난 효율

스토리지 아키텍쳐의 재구성
소프트웨어 기반 스토리지

차세대 NVM

intel inside ATOM

가속기

intel inside XEON

스토리지 SoCs

스토리지 소프트웨어

Cache Acceleration Software

Enterprise Edition for Lustre

효율성과 복원을 위한 지능 제공

용량과 가용성 별로 계층화

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빅데이터 처리 성능

비즈니스를 위한 의사결정 근거 자료 분석을 보다 빠르게

TeraSort for 1TB

4 시간 이상의 처리시간

Hadoop 처리 시간

완전 인텔기반 솔루션으로는 10 분 미만

Intel® Xeon® 5600, HDD 와 1GbE

발표예정 자료에 의하면

80%이상 감소 예상[1]

INTEL® XEON® 프로세서 E5-2600 V2 로 업그레이드

~80 % 감소

SSD로 업그레이드

~50 % 감소

10GBE로 업그레이드

INTEL DISTRIBUTION

~40 % 감소

- 1. Source: Intel internal measurements. Benchmark run is Terasort with 1TB of data on Intel ® Xeon ® E5-2600 product family. Results have been simulated and are provided for informational purposes only. Results were derived using simulations run on an architecture simulator or model. Any difference in system hardware or software design or configuration may affect actual performance. Intel product plans in this presentation do not constitute Intel plan of record product roadmaps. Please contact your Intel representative to obtain Intel's current plan of record product roadmaps.
- For more information go to http://www.intel.com/performance
- *Other names and brands may be claimed as the property of others.

네트워크 혁신

소프트웨어 정의(Software Defined) 인프라의 성장

82%의
전세계 통신업체가 SDN/NFV를
2013[1] 년에 도입 검토

신규 서비스, 네트워크 최적화 및
단순화된 프로비저닝 에 의해 주도됨

1 Source: Infonetics research SDN and NFV Strategies: Global Service Provider Survey July 8, 2013

네트워크 아키텍쳐의 재구성
소프트웨어 기반 네트워크*(SDN)*

수동	자동화
고정형	유연성
하드웨어 기반	소프트웨어 기반

표준화. 가상화. 자동화.

네트워크 아키텍쳐의 재구성

기존 네트워크

서비스를 위한 아이디어

IT - 필요 범위설정

사용자 요구 적정분배

수작업으로 장비 구성

컴퓨팅, 저장장치 & 네트워크 서비스 셋업

서비스 가동

신규서비스 프로비져닝 시간:
수개월[1]

소프트웨어 정의 네트워크

서비스를 위한 아이디어

자동화된 서비스 오케스트레이션 & 어셈블리

자동화된 인프라 오케스트레이션

서비스 가동

신규서비스 프로비져닝 시간 :
수분[1]

1: : Intel IT

네트워크 말단의 새로운 서비스

현재의 베이스 스테이션

제약이 많은 프로그램기능.
Latency 로 인한 한계.

미래의 베이스 스테이션

말단에서 지능형 기능제공.
보다 빠르고, 개인화된 서비스 제공.

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Intel® Infrastructure Builders

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Intel® Network Builders

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솔루션의 가속화

- Software Defined Networking (SDN)
- Network Function Virtualization (NFV)

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Moore의 법칙을 네트워크에

1 - Intel Internal measurement of 2S Intel® Xeon® processor E5645 (2x6C Westmere-EP) 2.40 GHz vs 2S Intel® Xeon® E5-2658v2 (2x10C Ivy bridge-EP) 2.4 GHz 22 x 10GbE PCIe Gen2
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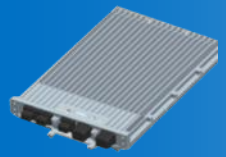
인텔 제온 프로세서 기반 혁신: 네트워크

Gateway GPRS Support Node:
네트워크 효율 및 용량 향상 및; 이전세대 아키텍처 대비 3배 성능 향상



FlexiBTS Server:
이전 세대 대비 3배의 성능향상과 함께 지능 향상

ADVANTECH Enabling an Intelligent Planet
ADLINK TECHNOLOGY INC.
DELL
DFI
EMERSON
ERICSSON
f5
hp
IBM
JumpGen SYSTEMS Next-Gen Multi-Core & Switching Platforms
Lanner
NEXCOM
radisys
TRENTON SYSTEMS Engineered For Reliability
ZNYX NETWORKS
ZTE中兴

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끊임없는 새로운 서비스

클라우드 서비스의 성장

~$200B

2016년 클라우드 서비스 매출

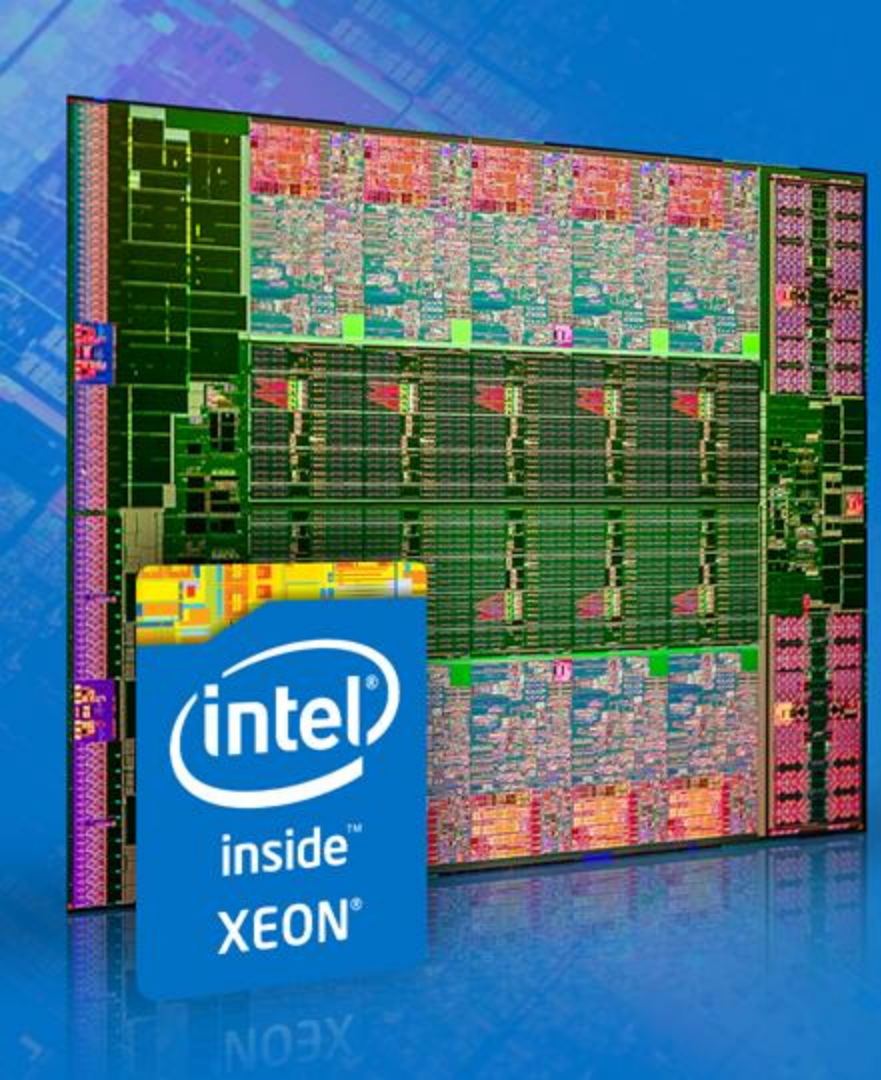
Source: Gartner Worldwide IT Spending Forecast, 2Q12 Update

- 기술 협력
- 마케팅 협력

인텔 제온 프로세서 제품군을 클러스터 기반 컴퓨팅에 적용한 최초의 클라우드 서비스 제공업체

광범위한 채택

Instance Family	Instance Type	Processor Arch	vCPU	ECU	Physical Processor	Intel® AES-NI	Intel® AVX	Intel® Turbo
General purpose	m1.small	32-bit or 64-bit	1	1	Intel Xeon Family	-	-	-
General purpose	m1.medium	32-bit or 64-bit	1	2	Intel Xeon Family	-	-	-
General purpose	m1.large	64-bit	2	4	Intel Xeon Family	-	-	-
General purpose	m1.xlarge	64-bit	4	8	Intel Xeon Family	-	-	-
General purpose	m3.xlarge	64-bit	4	13	Intel Xeon E5-2670	Yes	-	-
General purpose	m3.2xlarge	64-bit	8	26	Intel Xeon E5-2670	Yes	-	-
Compute optimized	c1.medium	32-bit or 64-bit	2	5	Intel Xeon Family	Yes	-	-
Compute optimized	c1.xlarge	64-bit	8	20	Intel Xeon Family	Yes	-	-
Compute optimized	cc2.8xlarge	64-bit	32	88	Intel Xeon E5-2670	Yes	Yes	Yes
Memory	m2.xlarge	64-bit	2	6.5	Intel Xeon	Yes	-	-



차세대

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세계 최고를 기록한
성능 및 효율성

서버, 스토리지 및
네트워크의 혁신

사용자 경험을 향상시키기 위한
신속한 서비스 제공

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Relative performance for each benchmark is calculated by taking the actual benchmark result for the first platform tested and assigning it a value of 1.0 as a baseline. Relative performance for the remaining platforms tested was calculated by dividing the actual benchmark result for the baseline platform into each of the specific benchmark results of each of the other platforms and assigning them a relative performance number that correlates with the performance improvements reported.

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Intel® Turbo Boost Technology: Requires a system with Intel® Turbo Boost Technology. Intel Turbo Boost Technology and Intel Turbo Boost Technology 2.0 are only available on select Intel® processors. Consult your system manufacturer. Performance varies depending on hardware, software, and system configuration. For more information, visit http://www.intel.com/go/turbo

Intel® Enhanced Intel SpeedStep® Technology: See the Processor Spec Finder at http://ark.intel.com/ or contact your Intel representative for more information.

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