

インテルの考える、 今後のデータセンターと クラウド

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議題

- **我々が直面する課題**
- **IT基盤変革の時**
- **Amazon Web Services & Intel**
- **AWS活用事例**

そして...協業の拡大

- **AWS & IntelによるIoT市場支援**



我々が直面する課題



ITが切り開く新たな地平線



>1 ZBに及ぶインター
ネット上のトラフィック



>150億の接続された
デバイス



>10億人の
ネット接続人口

...2015年には

技術による変革

新たなビジネス +
新たな活用法



エネルギー



店舗



スマート
シティー



医療



金融



交通

マルチ
クライアント

物のインター
ネット(IoT)

ビッグデータ

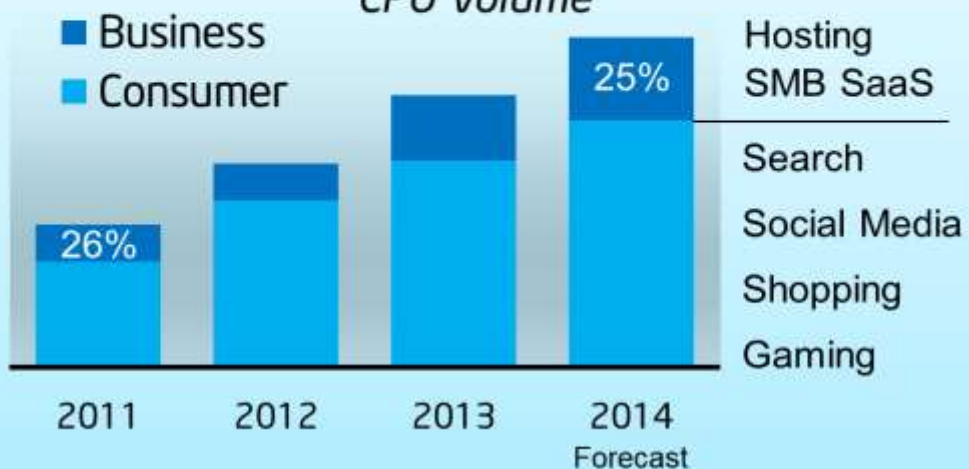
クラウド

セキュリティー

クラウド成長を牽引するデジタル・サービス経済

Cloud: 75% of Growth from Consumer Services¹

Consumer vs. Business Cloud
CPU Volume



新たなサービスがデバイスの需要を生む
新たなデバイスがサービスの需要を生む



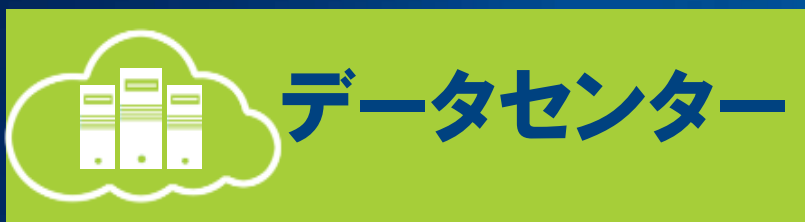
クラウドの成長(2017年まで、CAGR20%+)¹



¹ Source: Intel internal analysis

ビジネスとITの成長のスパイラス

...続く成長



成功へは、新たな考え方が必要

今後のデータセンター運用の課題

7.9 ZB in 2015

宇宙にある星の数より3倍もの
ビット数がデジタルの世界に



90% of Data

過去2年間で生み出されたデー
タの割合



200PB

中国のとあるスマートシティで
使われるストレージ



>50億

携帯端末での通話、メール、
ツイート、ブラウジング



966 Exabytes

携帯端末での通話、メール、ツイ
ート、ブラウジングされるデータ量

30億DVD

毎月のビデオ視聴、
毎秒百万分のビデオデータが
IPネット網を通過 *



情報爆発が現実!

*Cisco Visual networking index, Feb '13 <http://arstechnica.com/business/2012/05/bandwidth-explosion-as-internet-use-soars-can-bottlenecks-be-averted>



大きなビジネス機会：データから価値の創出



エンタープライズにおける顕著なトレンド

ビッグデータ

6%

のエンタープライズ
では、ビッグデータ
分析を基にした意
思決定を実施¹

クラウド

9%

のエンタープライズ
負荷がパブリック・
クラウドにて実行²

HPC

12%

のUSの製造業では
HPCクラスターを
活用³

1: Intel enterprise customer IT spending survey Q1 2013

2 IDG Enterprise 2012 Cloud Computing key trends and future effects

3 Intersect360 Research and NCMS, "Modeling and Simulation at U.S. Manufacturers: The Case for Digital Manufacturing," 2011



エンタープライズにおける大きな機会

分析を上手に使っている企業は...

2X

データに基づく
意思決定

5X

他社より速い
意思決定

3X

意思決定に基づく
実行の速度

2X

決算結果
上位25%

学び成功するか、消え行くか

引き裂かれるIT部門

経営層の期待

- 絶対落ちないように
- 柔軟性と俊敏性担保
- クラウド並みの経済性
- コンプライアンス対応

ユーザーの期待

- スマホ並みに簡単に
- より新しい技術
- より早いサービスイン
- 社内外使えるものを使う

IT基盤変革の時



新たなIT基盤の変革

Computer-Centric

Network-Centric

Human-Centric



オートメーションによる
生産性向上

コネクティビティによる
コスト削減

クラウドやデバイスによる
迅速なサービス

IT: ビジネスを効率化するツールからビジネスそのものへ

データセンター運用に対する継続的な負荷

ネットワーク

2-3週で新たなサービスの準備¹



ストレージ

年率40%で増え続けるデータ量²、
非構造型のデータが90%³



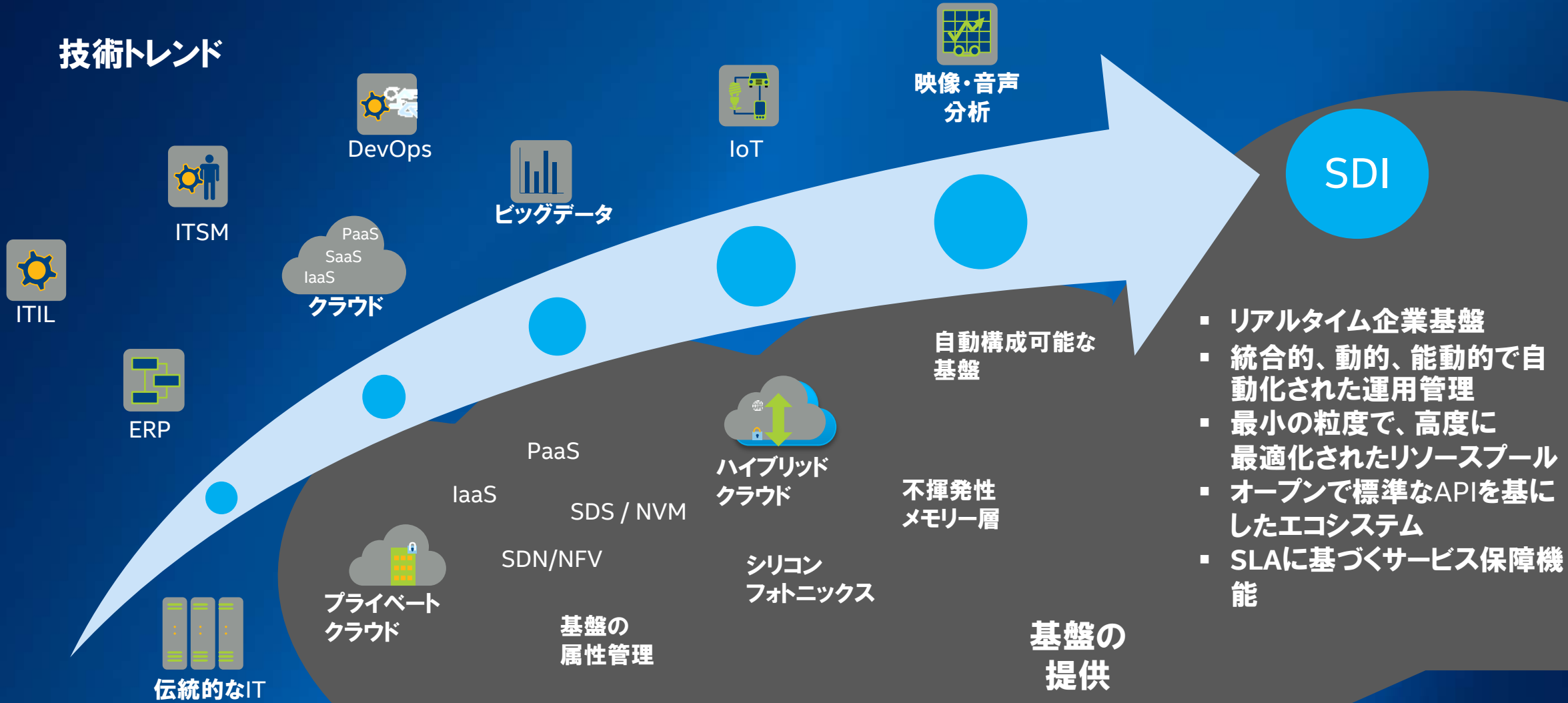
サーバー

仮想化にもかかわらず、
平均50%をきる使用率⁴



ソフトウェア・デファインド基盤(SDI)へ向けて、 データセンターのアーキテクチャの变革

技術トレンド



クラウド化への対応は避けられない

クラウド戦略がIT部門への圧力に対応するための回答

経費削減への圧力



- より多くをよし少ない予算で
- グローバル化対応
- より多種類のサービスを

俊敏性への圧力



- ビジネスの速度にあった時間軸でのサービス
- 24 x 7 x 365 何時でもどこでも

セキュアでコンプライアンス準拠



- エキューリティー確保とプライバシーの保護
- ポリシーや統制への対応

クラウド戦略

1

CAPEX/OPEXのバランスを取りつつ、“基本に投資、バーストはパートナー活用”のようなモデルを可能とする

2

ソフトウェア・デファインド基盤(SDI)を視野に、価値創出までの時間と安全なサービス展開までの時間を短縮

3

サービスのオンデマンドでの提供: 技術革新におけるリーダーとの協業

Amazon Web Services & Intel



インテルのデータセンター技術に対する継続的な投資

企業IT



クラウド
サービス



テレコミュニ
ケーション



高度科学技術計算



インテルのデータセンター技術に対する継続的な投資

企業IT

8% CAGR

クラウド
サービス

>25% CAGR

テレコミュニ
ケーション

>15% CAGR

高度科学技術計算

>20% CAGR

サーバー

CPUs, Ethernet & Infiniband Controllers, Management SW

ネットワーク

CPUs, Accelerators, Ethernet & Infiniband Switch Silicon

ストレージ

CPUs, Flash, Caching & RAID SW

ソフトウェア

Hadoop, Lustre File System, Datacenter Manager, Wind River OS, API...



インテルの確固たるムーアの法則の継続に 歩調を合わせるAWS

Intel® Core™ Microarchitecture	Intel® Microarchitecture Codename Nehalem	Intel® Microarchitecture Codename Sandy Bridge	Intel® Microarchitecture Codename Haswell				
Merom	Penryn	Nehalem	Westmere	Sandy Bridge	Ivy Bridge	Haswell	Broadwell
65nm	45nm	45nm	32nm	32nm	22nm	22nm	14nm
New Micro- architecture	New Process Technology	New Micro- architecture	New Process Technology	New Micro- architecture	New Process Technology	New Micro- architecture	New Process Technology
TOCK	TICK	TOCK	TICK	TOCK	TICK	TOCK	TICK
					AWS EC2 C3	AWS EC2 C4	

“The number of transistors incorporated
in a chip will approximately double
every 24 months.”

Gordon Moore, Former CEO & Intel co-founder



AWS向けの特別なインテルXeonプロセッサ C4 = 最高性能のEC2インスタンス

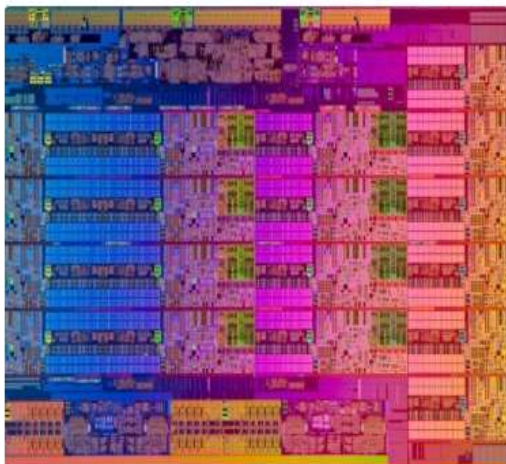


PERFORMANCE

New EC2 Instances – C4

AWS, Intel Collaborate On New Haswell Xeon Instances

November 14, 2014 by George Leopold



New instances unveiled by Amazon Web Services this week based on a customized version of Intel's Xeon E5 processor reflect what the cloud provider emphasized is a steady increase in the "intensity" of workloads running on the cloud.

AWS CTO Werner Vogels unveiled the new instances, based on the "Haswell" Xeon E5-2600 v3 processors that Intel launched in September, dubbed C4 during the AWS re:Invent confab in Las Vegas. The new instance type for Amazon's Elastic

Computer Cloud (EC2) platform is specifically based on a Xeon E5-2666 v3 processor with up to 36 virtual cores across two sockets. AWS said it would implement the custom version of the processor on EC2 running at a base speed of 2.9 GHz. It would also be capable of 3.5 GHz speeds with a Turbo boost.

The new C4 instances will again use hardware virtualization to squeeze the most performance from Haswell, AWS chief evangelist Jeff Barr noted in a blog post. Barr added that the new instances would operate within a virtual private cloud.



Intel Processor Features

Amazon EC2 instances provide access to the following processor features from Intel including:

- Intel® AES New Instructions (AES-NI):** Intel AES-NI encryption instruction set improves upon the original Advanced Encryption Standard (AES) algorithm to provide faster data protection and greater security.
- Intel® Advanced Vector Extensions (Intel® AVX):** Intel AVX is a 256-bit instruction set extension designed for applications that are Floating Point (FP) intensive. It improves performance for applications like image and audio/video processing, scientific simulations, financial analytics, and 3D modeling and analysis.
- Intel® Turbo Boost Technology:** Intel Turbo Boost Technology provides more performance when needed. The processor is able to automatically run cores faster than the base operating frequency to help you get more done faster.



インスタンス名	vCPU 数	メモリー	ネットワーク性能	EBS の最適化	64 ビット HVM AMI	C/P ステート制御	インテル® ターボ・ブースト・テクノロジー
c4.large	2	3.75 GiB	中	✓	必要		3.2 GHz
c4.xlarge	4	7.5 GiB	中	✓	必要		3.2 GHz
c4.2xlarge	8	15 GiB	高	✓	必要		3.2 GHz
c4.4xlarge	16	30 GiB	高	✓	必要		3.2 GHz
c4.8xlarge	36	60 GiB	10 Gbps	✓	必要	✓	3.5 GHz



EC2におけるインテル技術のリスト

AWSが提供する幅広い選択肢から、ユースケースに最適化されたインスタンスを選択可能

AWS インスタンス・タイプ	EC2 最高の 性能 : C4	コンピュー ティングの 最適化 : C3	メモリーの 最適化 : R3	I/O の 最適化 : I2	汎用		GPU: G2	ストレージの 最適化 : H51
					バランスがよい: M3 および	パースト機能: T2		
インテル® プロセッサー	インテル® Xeon® プロセッサー E5-2666 v3	インテル® Xeon® プロセッサー E5-2680 v2	インテル® Xeon® プロセッサー E5-2670 v2	インテル® Xeon® プロセッサー E5-2670 v2	インテル® Xeon® プロセッサー E5-2670 v2	インテル® Xeon® プロセッサー・ ファミリー	インテル® Xeon® プロセッサー E5-2670	インテル® Xeon® プロセッサー・ ファミリー
インテルのプロセス技術 * 開発コード名	22nm Haswell*	22nm Ivy Bridge*	22nm Ivy Bridge*	22nm Ivy Bridge*	22nm Ivy Bridge*	✓	32nm Sandy Bridge*	✓
インテル® AVX	✓	✓	✓	✓	✓	✓	✓	✓
インテル® AES-NI	✓	✓	✓	✓	✓	✓		
インテル® ターボ・ ブースト・テクノロジー	✓	✓	✓	✓	✓	✓		
SSD ストレージ	EBS-OPT (デフォルト)	✓	✓	✓	✓		✓	

AWSの顧客のメリット例

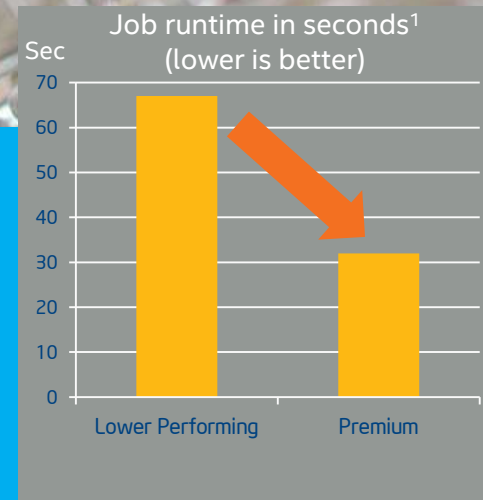


Novartis社はプレミアム・インスタンスを活用することで、コストを削減

up to
65%
Cost reduction¹



up to
52%
Decrease in
in run-time¹



¹ NIBR, of Novartis Pharmaceuticals ran Next Gen Sequencing, Imaging & Modeling & Sim techniques (specifically Virtual Screening w/CPU bound, low mem, low IO, network, parallel Benchmarking SW ran same job many times (workload avg 32 secs on AWS cc2.8xlarge vs 1min 7 sec on AWS m1.large) revealed that best ROI was with cc2vspot instances 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.

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Intel & AWS によるビッグデータ事例

顧客のビッグデータ分析をより身近に

Learn what our customers are able to do in 60 minutes

The opportunities exist for data to transform businesses in fields as diverse as travel, genomics, e-commerce and space exploration. They are created by the on-demand availability of the high performance Intel Xeon E5 processor family in the Amazon Web Services cloud.



NASA JPL 2:37

Accelerates Discovery by
840% Exploring Mars



SCHRÖDINGER 1:34

16 Million Model
Simulations an Hour



yelp 1:35

Calculates 120 Million
Statistics an Hour



CHANNEL FOUR TELEVISION 3:30

Analyze In-session Data
and Deliver Targeted Ads

More at
<https://www.cloudinsights.com/Big-Data/>

HOME BIG DATA HPC CLOUD

amazon web services intel CLOUD INSIGHTS

Cloud Powers Next Generation o...
The computed tomography (CT) scan has become a well-known medical procedure, with over 68 million performed each year

HPC Share
Aerospace Tackles HPC Cloud's...
For a 50-year old organization that operates in some of the strictest security environments, Aerospace Corporation

BIG DATA Share
Case Study: Big Data Cloud Com...
High-performance computing in the cloud has enhanced the close collaboration between mission control

More at <http://aws.amazon.com/intel> and <http://aws.amazon.com/solutions/case-studies>

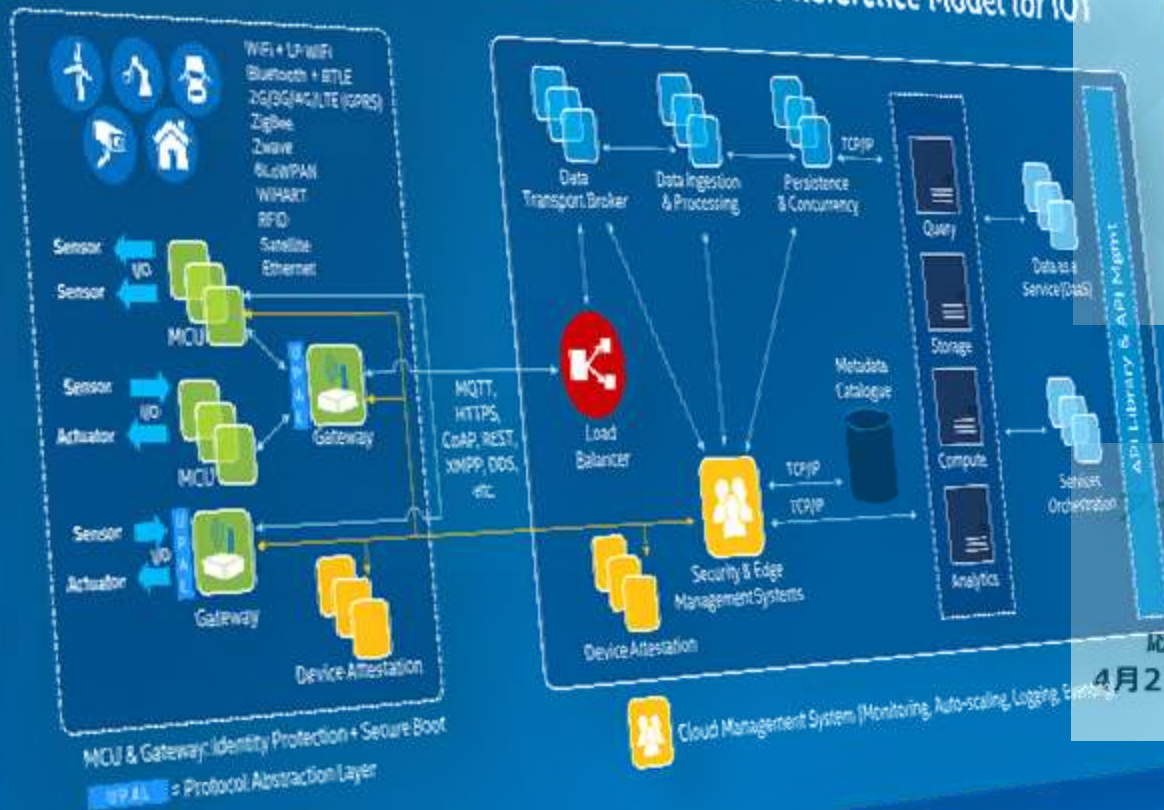


AWS & Intel 更なる協業



AWS & Intel によるIoT市場支援

Atlantic Ridge is Intel's Implementation of the Reference Model for IoT



AWS Summit
TOKYO

IoTアイデアソン&ハッカソン 2015

アイデア
応募

一次審査
アイデアソン
参加者発表

アイデアソン
5チーム選考

開発期間

ハッカソン
&
発表

応募締切
4月22日(水)

4月24日(金)

実施日
5月9日(土)

実施日
6月2日(火)

駅すぱあと Web サービスに Mashery API マネジメントを導入 - 株式会社ヴァル研究所様



- API のセキュリティ確保
- API キーの発行管理
- ユーザー管理・認証
- API リファレンスページの公開
- API 利用プラン管理
- API 帯域制御



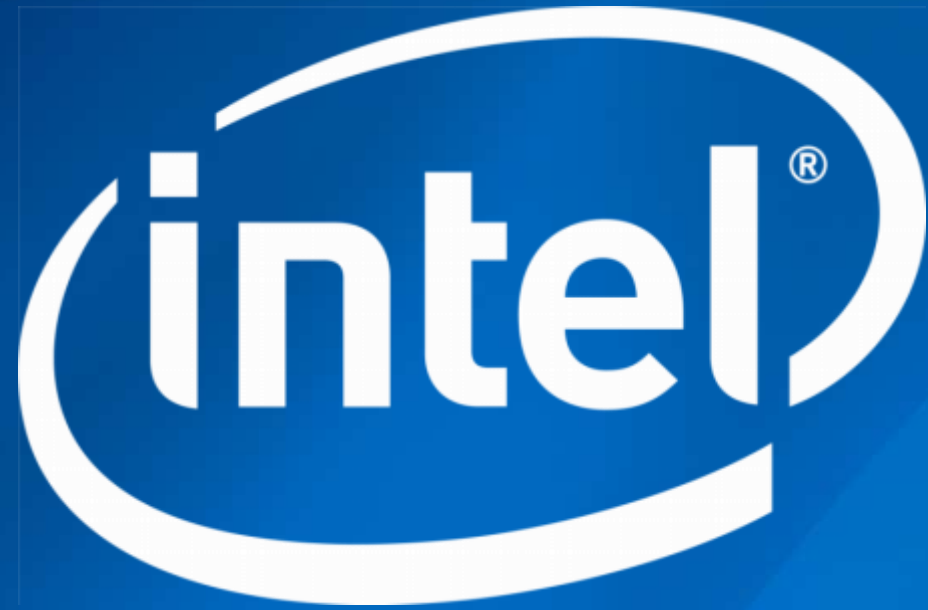
インテルブースでMasheryをデモ・ご紹介中です。ぜひお立ち寄りください。

API 管理部分を Mashery に移行し、
API を活用した優れた製品、サービスの開発に集中

まとめ

- クラウド化への構造改革は、ビジネス価値創出への時間を短縮、オンデマンドでのサービスを可能とし、ITを支援部隊から戦略的パートナーへ移行するために大変重要な意味を持つ
- クラウド型基盤が、IT活用を劇的に変化させ、様々な資源をスムーズに結合させ、スケーラブルな環境で、膨大なデータからインサイトを読み取り、価値を生み出すことを可能とする
- インテルとAWSは、あくなきクラウドの進化を推進し、顧客のビジネス課題解決のために協業を続ける





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