

Hyperscale Data Centers: Market Shares, Strategies, and Forecasts, Worldwide, 2017 to 2023

<https://marketpublishers.com/r/H97B716572BEN.html>

Date: January 2017

Pages: 846

Price: US\$ 4,200.00 (Single User License)

ID: H97B716572BEN

Abstracts

The 2017 study has 846 pages, 320 tables and figures. Worldwide hyperscale data center markets implement cloud computing with shared resource and foolproof security systems that protect the integrity of corporate data. Cloud data centers are poised to achieve explosive growth as they replace enterprise web server farms with cloud computing and with cloud 2.0 automated process computing. The implementation of secure large computing capability inside data center buildings provides economies of scale not matched by current state of the art enterprise data center standalone server technology.

Building size cloud 2.0 computer implementations feature simplicity of design achievable only with scale. These data centers implement cloud 2.0 in a move that works better than much of the current cloud computing. The cloud 2.0 data centers have been reduced to two types of components, an ASIC server: single chip servers and a network based on a matching ASIC switch. Data centers are implemented with a software controller for that ASIC server and switch infrastructure.

The major driving factors for Cloud 2.0 mega data center market are cost benefit, growing colocation services, need for data consolidation, and cloud. Amazon (AWS), Microsoft, Google, and Facebook data centers are in a class by themselves, they have functioning fully automatic, self-healing, networked mega datacenters that operate at fiber optic speeds to create a fabric that can access any node in any particular data center because there are multiple pathways to every node. In this manner, they automate applications integration for any data in the mega data center.

Cloud 2.0 mega data centers are different from ordinary cloud computing. Mega datacenter networks deliver unprecedented speed at the scale of entire buildings. They are built for modularity. They are constantly upgraded to meet the insatiable bandwidth demands of the latest generation of servers. They are managed for availability.

“The mega data centers have stepped in to do the job of automated process in the data

center, increasing compute capacity efficiently by simplifying the processing task into two simple component parts that can scale on demand. The added benefit of automated application integration brings massive savings to the IT budget, replacing manual process for application integration.”

The only way to realign enterprise data center cost structures is to automate infrastructure management and orchestration. Mega data centers automate server and connectivity management. Cisco UCS Director illustrates software that automates everything beyond. Cisco UCS automates switching and storage, along with hypervisor, operating system, and virtual machine provisioning.

As IT relies more on virtualization and cloud mega data center computing, the physical infrastructure is flexible and agile enough to support the virtual infrastructure.

Comprehensive infrastructure management and orchestration is essential. The enterprise data centers and many cloud infrastructure operations all have similar problems of being mired in administrative expense. This presents a problem for those tasked with running companies.

The Internet has grown by a factor of 100 over the past 10 years. To accommodate that growth, hyperscale data centers have evolved to provide processing at scale, known as cloud computing. Facebook for one, has increased the corporate data center compute capacity by a factor of 1,000. To meet future demands on the Internet over the next 10 years, the company needs to increase capacity by the same amount again. Nobody really knows how to get there.

Everyone should know by now that the enterprise data center is dead. It will no longer exist in three years, that is the time it takes servers to become outdated and need replacement. In that timeframe, enterprises will migrate workload from the core enterprise servers to the large data center that can provide processing at half the cost of current processing. Maybe this forecast is too aggressive, but probably not. The mainframe stays around as detailed in a different report.

The choices for migration are to regular cloud data centers that remain mired in manual process and lack of automation vs. cloud 2.0 mega data centers that implement automated process inside a building that has scale.

The hesitation that companies have had in migrating to the cloud have been concerns about security and protecting the privacy of the corporate data, protecting the crown jewels of the company so to speak. But the security in a shared data center can be as good or even better than security in an enterprise data center. The large independent players profiled in this report have found ways to protect their clients and have very sophisticated systems in place for serving their clients. At this point security concerns are a myth. The much greater risk is that a competitor will be able to cut operating costs by a half or even 500% by moving to cloud data center configurations, providing insurmountable competitive advantage.

The commercial data center providers are sophisticated and reliable. The good ones have been around for years, building systems that work in shared environments that are able to protect the integrity of each client's data. At this point a good independent analyst is the best source for judging what cloud environments best suit a client. This study outlines the inevitability of migrating to cloud. Enterprise data centers are in melt down mode.

When technology markets move, they move very quickly and this cloud data center market has been artificially protected by incumbent vendors scaring existing customers about security vulnerabilities, so when the air is let out of the myth, the existing IT culture, it is likely to collapse.

As the team wrote optical transceiver study, interviews revealed a startling observation: "The linear data center is outdated, it has become a bottleneck in the era of the digital economy, the quantity of data has outpaced the ability of the data center to manage and the traditional data center has become a bottleneck. Have you seen what is going on in the mega data centers?" The mega data centers are different from cloud computing and different from the enterprise linear computing data centers, the mega data centers are handling data at the speed of light. This represents a huge change in computing going forward, virtually all the existing data centers are obsolete. This study and the one for CEOs addresses these issues.

As we build data centers with the capacity to move data inside at 400 GB per second, more data can be moved around. More analysis can be done, more insight can be gained, more alerts can trigger robotic response.

The value of automated process to business has been clear since the inception of computing. Recently, automated process has taken a sudden leap forward. Many companies had been stuck in their enterprise data center spending patterns encompassing manual process. In the enterprise data center the vast majority of IT administrative expenditures are for maintenance rather than for addressing the long-term strategic initiatives.

Companies that remained in the manual administrative spending on the data center mode including IBM and Hewlett Packard and most of their customers failed to grow at the same pace as the rapid growth tech companies, Google, Facebook, Amazon, and Microsoft.

Business growth depends on technology spending that is intelligent, not on manual labor spending. The manual labor is always slow and error prone, spending on manual process is counterproductive vs automation spending. So many IT processes have been manual, tedious, and error prone that they have held the company back relative to the competition. Mega data centers get rid of that problem. The companies that invested in mega data centers and automated process for the data centers have had astounding growth, while the companies stuck with ordinary data centers are mired in slow growth

mode.

Topology, technology and design favor building a digital business solutions. Vendors offer colocation-based, programmable networking centers provide data center interconnect fabric. A fabric allows dynamic interconnection between enterprise peers, cloud providers, communications providers and a growing marketplace of service providers.

The Hyperscale Data Centers: market size at \$86.9.7 million in 2016 is anticipated to be \$359.7 billion in 2023. The market has astoundingly rapid growth for a market that really is not yet well defined. The increasing scope of applications across different industries, manufacturing, medical, retail, game, and automotive, all industries really, is expected to drive demand over the forecast period to these unprecedented levels, reaching into the trillion-dollar market arenas soon.

The hyperscale data centers are position to manage the explosion in web data, including data from IoT technology that is in the nascent stage with a huge growth potential, and has attracted large investments contributing to the industry growth.

Contents

HYPERSCALE DATACENTERS EXECUTIVE SUMMARY

Hyperscale Data Center Scale and Automation

Cloud 2.0 Mega Data Center Fabric Implementation

Cloud 2.0 Mega Data Center Different from the Hyperscale Cloud

Cloud 2.0 Mega Data Center Automatic Rules and Push-Button Actions

Making Individual Circuits And Devices Unimportant Is A Primary Aim Of Fabric Architecture

Digital Data Expanding Exponentially, Global IP Traffic Passes Zettabyte (1000 Exabytes) Threshold

Google Kubernetes Open Source Container Control System

Google Kubernetes Defacto Standard Container Management System

Google Shift from Bare Metal To Container Controllers

Cloud 2.0 Mega Data Center Market Driving Forces

Hyperscale Data Center Market Shares

Cloud Datacenter, Co-Location, and Social Media Cloud, Revenue Market Shares, Dollars, Worldwide, 2016

Cloud 2.0 Mega Data Center Market Forecasts

1. HYPERSCALE DATACENTERS: MARKET DESCRIPTION AND MARKET DYNAMICS

1.1 Data Center Manager Not Career Track for CEO

1.1.1 Colocation Shared Infrastructure

1.1.2 Power and Data Center Fault Tolerance

1.2 Fiber High Bandwidth Datacenters

1.3 100 Gbps Headed For The Data Center

1.3.1 100 Gbps Adoption

1.4 Scale: Cloud 2.0 Mega Data Center Containers

1.4.1 Data Center Architectures Evolving

1.4.2 High-Performance Cloud Computing Market Segments

1.4.3 Cisco CRS-3 Core Routing Platform

1.5 Evolution of Data Center Strategy

1.6 Cabling in The Datacenter

1.6.1 Datacenter Metrics

1.6.1 Digitalization Forcing Data Centers to Evolve

1.6.2 A One-Stop Shop

1.6.3 Growing With Business

2. HYPERSCALE DATACENTERS MARKET SHARES AND FORECASTS

2.1 Hyperscale Data Center Scale and Automation

2.1.1 Cloud 2.0 Mega Data Center Fabric Implementation

2.1.2 Cloud 2.0 Mega Data Center Different from the Hyperscale Cloud

2.1.3 Cloud 2.0 Mega Data Center Automatic Rules and Push-Button Actions

2.1.4 Making Individual Circuits And Devices Unimportant Is A Primary Aim Of Fabric Architecture

2.1.5 Digital Data Expanding Exponentially, Global IP Traffic Passes Zettabyte (1000 Exabytes) Threshold

2.1.6 Google Kubernetes Open Source Container Control System

2.1.7 Google Kubernetes Defacto Standard Container Management System

2.1.8 Google Shift from Bare Metal To Container Controllers

2.1.9 Cloud 2.0 Mega Data Center Market Driving Forces

2.2 Hyperscale Data Center Market Shares

2.2.1 Cloud Datacenter, Co-Location, and Social Media Cloud, Revenue Market Shares, Dollars, Worldwide, 2016

2.2.2 Cloud 2.0 Mega Datacenter Cap Ex Spending Market Shares Dollars, Worldwide, 2016

2.2.3 Amazon Capex for Cloud 2.0 Mega Data Centers

2.2.4 Amazon (AWS) Cloud

2.2.5 Amazon Datacenter Footprint

2.2.6 Cloud 2.0 Mega Data Center Social Media and Search Revenue Market Shares, Dollars, 2016

2.2.7 Top Hyperscale Companies

2.2.8 Biggest Data Centers

2.2.9 Microsoft Azure

2.2.10 Microsoft Data Center, Dublin, 550,000 Sf

2.2.11 Microsoft Data Center Container Area in Chicago.

2.2.12 Microsoft Quincy Data Centers, 470,000 Square Feet

2.2.13 . Microsoft San Antonio Data Center, 470,000 SF

2.2.14 Microsoft 3rd Data Center in Bexar Could Employ 150

2.2.15 Microsoft Builds the Intelligent Cloud Platform

2.2.16 Microsoft's datacenter footprint

2.2.17 Google Datacenter Footprint

2.2.18 Apple Datacenter Footprint

2.2.1 Facebook Datacenter Footprint

- 2.2.2 Chef Web-Scale Automation Of Systems Integration In The Cloud
- 2.2.3 Docker Open Platform
- 2.2.4 OpenStack
- 2.2.5 Ragingwire
- 2.2.6 Simplifying Messaging is a Priority for Goldman Sachs Implementing Automation
- 2.2.7 IBM
- 2.3 Cloud 2.0 Mega Data Center Market Forecasts
 - 2.3.1 Market Segments: Web Social Media, Web Wireless Apps, Enterprise / Business Transactions, Co-Location, And Broadcast / Communications
 - 2.3.2 Cloud 2.0 Mega Data Center Is Changing The Hardware And Data Center Markets
- 2.4 Hyperscale Data Center Storage Market Analysis
- 2.5 Mega-Datacenter: Internet Giants Continue To Increase Capex
 - 2.5.1 Apple Datacenter Footprint
 - 2.5.2 Google Datacenter Footprint
 - 2.5.3 Microsoft Datacenter Footprint
 - 2.5.4 Amazon Datacenter Footprint
 - 2.5.5 Facebook Datacenter Footprint
 - 2.5.6 Service Tiers and Applications
 - 2.5.7 M2M industry
 - 2.5.8 Cloud 2.0 Mega Data Center Segments
 - 2.5.9 Cloud 2.0 Mega Data Center Positioning
- 2.6 Cloud 2.0 Mega Data Center Size
 - 2.6.1 Cloud 2.0 Mega Data Centers
 - 2.6.2 Public Cloud Infrastructure
- 2.7 Multi-Tenant Data Center Market Shares and Revenue Forecasts
 - 2.7.1 Colocation Providers
 - 2.7.2 Carrier-Neutral Colocation Providers
 - 2.7.3 Wholesale Data Center Providers
 - 2.7.4 Largest Data Centers
- 2.8 Cloud 2.0 Mega Data Center
 - 2.8.1 Cloud 2.0 Mega Data Center Is Changing The Hardware And Data Center Markets
 - 2.8.2 Storage SATA Drives Meet Mega Data Center Requirements
 - 2.8.1 Data Center Switching
 - 2.8.2 ASIC Switch Vendors
 - 2.8.3 Data Center Rack Market
- 2.9 Hyperscale Datacenter Future
 - 2.9.1 Public Cloud Services Revenue

2.10 Edge Cloud Data Centers

2.10.1 Edge Data Center Definition

2.11 Data Expanding And Tools Used To Share, Store And Analyze Evolving At Phenomenal Rates

2.11.1 Video Traffic

2.11.2 Cisco Analysis of Business IP Traffic

2.11.3 Increasing Video Definition: By 2020, More Than 40 Percent of Connected Flat-Panel TV Sets Will Be 4K

2.11.4 M2M Applications

2.11.5 Applications, For Telemedicine And Smart Car Navigation Systems, Require Greater Bandwidth And Lower Latency

2.11.6 Explosion of Data Inside Cloud 2.0 Mega Data Center with Multi-Threading

2.11.7 Cloud 2.0 Mega Data Center Multi-Threading Automates Systems Integration

2.11.8 Fixed Broadband Speeds (in Mbps), 2015–2020

2.11.9 Internet Traffic Trends

2.11.10 Internet of Things

2.11.11 The Rise of the Converged “Digital Enterprise”

2.11.12 Enterprise Data Centers Give Way to Commercial Data Centers

2.12 Hyperscale Data Center TCO and Pricing: Server vs. Mainframe vs. Cloud vs. Cloud 2.0

2.12.1 Labor Accounts For 75% Of The Cost Of An Enterprise Web Server Center

2.12.2 Cloud 2.0 Systems And The Mainframe Computing Systems Compared

2.12.3 Cloud 2.0 and Mainframe Implements Shared Resource

2.12.4 Average Operating Density Of Data Centers

2.12.5 Mainframe Capacity vs. Cloud 2.0

2.12.6 Enterprise IT Departments TCO / ROI Custom Data Center Cost Analysis

2.12.7 Server, Mainframe, Cloud, and Cloud 2.0 Cost Comparisons

2.12.8 Server to MIPS Conversion Calculations

2.12.9 Mainframe Updates And Cost Efficiencies

2.12.10 Cost of Cloud Computing

2.12.11 Types of Cloud Computing

2.12.12 Software-Defined Infrastructure

2.12.13 Scale

2.13 Cloud Hyperscale Data Center Regional Market Analysis

2.13.1 US Data Center REITs

2.13.2 Chicago Data Center Supply Grows

2.13.3 Digital Realty Trust Largest Data Center: Cermak, Chicago, 1.1 Million Square Feet

2.13.4 US Data Center Activity

- 2.13.5 Cloud Demand Globally
- 2.13.6 Landlords Adapt to Cloud Globally
- 2.13.7 Amazon, Google Detail Next Round of Cloud Data Center Launches
- 2.13.1 Cloud Data Centers Market in Europe
- 2.13.2 Cloud Data Centers Market in Ireland
- 2.13.3 Japanese Data Centers

3. HYPERSCALE DATACENTER INFRASTRUCTURE DESCRIPTION

3.1 Amazon Cloud

- 3.1.1 Amazon AWS Regions and Availability Zones
- 3.1.2 Amazon Addresses Enterprise Cloud Market, Partnering With VMware
- 3.1.3 AWS Achieves High Availability Through Multiple Availability Zones
- 3.1.4 AWS Improving Continuity Replication Between Regions
- 3.1.5 Amazon (AWS) Meeting Compliance and Data Residency Requirements
- 3.1.6 AWS Step Functions Software
- 3.1.7 Amazon QuickSight Software
- 3.1.8 Amazon North America
- 3.1.9 AWS Server Scale
- 3.1.10 AWS Network Scale

3.2 Facebook

3.2.1 Dupont Fabros Constructing Second Phase In Acc7 Represents An Expanded Relationship with Facebook

- 3.2.2 Facebook \$1B Cloud 2.0 Mega Data Center in Texas
- 3.2.3 Facebook \$300 Million Cloud 2.0 Mega Data Center in Iowa
- 3.2.4 Fort Worth Facebook Mega-Data Center
- 3.2.5 Facebook Forest City, N.C. Cloud 2.0 mega data center
- 3.2.6 Data Center Fabric, The Next-Generation Facebook Data Center Network
- 3.2.1 Facebook Altoona Data Center Networking Fabric
- 3.2.2 Facebook Clusters and Limits Of Clusters
- 3.2.3 Facebook Fabric
- 3.2.4 Facebook Network Technology
- 3.2.5 Facebook Fabric Gradual Scalability
- 3.2.6 Facebook Mega Datacenter Physical Infrastructure
- 3.2.7 Facebook Large Fabric Network Automation
- 3.2.8 Facebook Fabric Data Center Transparent Transition
- 3.2.9 Facebook Large-Scale Network

3.3 Google Meta Data Centers

- 3.3.1 Google Datacenter Network

- 3.3.2 Google Office Productivity Dynamic Architecture
- 3.3.3 Google Search Engine Dynamic Architecture
- 3.3.4 BigFiles
- 3.3.5 Repository
- 3.3.6 Google Clos Networks
- 3.3.7 Google B4 Datacenter WAN, a SDN
- 3.3.8 Google Programmable Access To Network Stack
- 3.3.9 Google Compute Engine Load Balancing
- 3.3.10 Google Compute Engine (GCE) TCP Stream Performance Improvements
- 3.3.11 Google The Dalles, Oregon Cloud 2.0 Mega Data Center
- 3.3.12 Lenoir, North Carolina
- 3.3.13 Google Hamina, Finland
- 3.3.14 Google Mayes County
- 3.3.15 Google Douglas County
- 3.3.16 Google Cloud 2.0 Mega Data Center St Ghislain, Belgium
- 3.3.17 Google Council Bluffs, Iowa Cloud 2.0 Mega Data Center
- 3.3.18 Google Douglas County Cloud 2.0 Mega Data Center
- 3.3.19 Google \$300m Expansion of Existing Metro Atlanta Data Center
- 3.3.20 Google B4 SDN Initiative Benefits: Not Need To Be A Network Engineer To Control A Network; Can Do It At An Application Level
- 3.3.21 Google Cloud 2.0 Mega Data Center in Finland
- 3.3.22 Google Switches Provide Scale-Out: Server And Storage Expansion
- 3.3.23 Google and Microsoft 25G Ethernet Consortium
- 3.3.24 Google Workload Definitions
- 3.3.25 Google Kubernetes Container
- 3.3.26 Google Optical Networking
- 3.3.27 Google Data Center Efficiency Measurements
- 3.3.28 Google Measuring and Improving Energy Use
- 3.3.29 Google Comprehensive Approach to Measuring PUE
- 3.3.30 Q3 2016 PUE Performance
- 3.4 Baidu
 - 3.4.1 Baidu Data Center, Shanxi
 - 3.4.2 China Mobile Working With Leading Chinese Language Search Engine Baidu And Schneider Electric
- 3.5 China Mobile
- 3.6 Tencent
 - 3.6.1 Tencent \$1 Billion Midwest China Data Center
 - 3.6.2 Tencent Facilitates Cloud
- 3.7 Smart City Data Center Comes Online

3.7.1 SNIA China Big Data Project

3.8 Alibaba

3.9 Yahoo

3.10 Microsoft

3.10.1 Microsoft .Net Dynamically Defines Reusable Modules

3.10.2 Microsoft Combines Managed Modules into Assemblies

3.10.3 Microsoft Architecture Dynamic Modular Processing

3.10.4 Microsoft Builds Azure Cloud Data Centers in Canada

3.10.5 Microsoft Dublin Cloud 2.0 mega data center

3.10.6 Microsoft Data Center Largest in U.S.

3.10.7 Microsoft Crafts Homegrown Linux For Azure Switches

3.10.8 Microsoft Azure Cloud Switch

3.10.9 Microsoft Azure CTO Cloud Building

3.10.10 Microsoft Cloud 2.0 Mega Data Center Multi-Tenant Containers

3.10.11 Microsoft Managed Clustering and Container Management: Docker and Mesos

3.10.12 Kubernetes From Google or Mesos

3.10.13 Microsoft Second Generation Open Cloud Servers

3.10.14 Azure Active Directory

3.10.15 Microsoft Azure Stack Platform Brings The Suite Of Azure Services To The Corporate Datacenter

3.10.16 Hardware Foundation For Microsoft Azure Stack

3.11 Apple

3.11.1 Apple Invests €1.7 Billion in European Data Centres

3.11.2 Apple Builds \$2 Billion Cloud 2.0 mega data center in Arizona

3.12 Goldman Sachs

3.12.1 Simplifying Messaging is a Priority for Goldman Sachs

3.12.2 Goldman Sachs Cloud 2.0 Mega Data Center

3.12.3 Goldman Sachs Security for The Financial Services Organization

3.12.4 Goldman Sachs: Containers Have Real Promise at The Institution

3.12.5 Goldman Sachs Cloud Computing

3.13 Fidelity Investments

3.13.1 Fidelity Investments Core Unit Building Blocks

3.13.2 Fidelity Centercore Design

3.13.3 Fidelity Ties Into Modular Momentum Among Financials

3.14 QTS Custom Data Centers

3.14.1 QTS Multi Tenant Data Center

3.14.2 QTS Critical Facilities Management

3.15 IBM

- 3.15.1 IBM z Systems in the Cloud
- 3.15.2 IBM Cloud Managed Services on z Systems
- 3.15.3 IBM Cloud Managed Services on z Systems
- 3.15.4 Linux-Based Solutions Under IBM z/VM Shared Infrastructure Support Hybrid Workloads
- 3.15.5 IBM Cloud Managed Services on z Systems
- 3.15.6 IBM Builds a Cloud 2.0 mega data center in India
- 3.15.7 IBM Outsourcing
- 3.15.8 IBM Server SAN Software-Led Infrastructure
- 3.15.9 IBM Partnership with American Airlines
- 3.15.10 IBM Cloud Momentum In The Airlines Industry
- 3.15.11 IBM CICS
- 3.15.12 IBM z13 Mainframe Hardware Platform
- 3.15.13 IBM z13 Software Compression Algorithm In Db/2 Cuts The Number Of Bits Required To Store Data From 80 Bits To Four Bits
- 3.16 DuPont Fabros Technology
 - 3.16.1 Data Center Market Trends For Wholesale Commissioned MW Trend
- 3.17 Hewlett Packard
 - 3.17.1 HP Hyperscale Composable Infrastructure
 - 3.17.2 HP Data Center Control Human Tools With Point And Click Interfaces
 - 3.17.3 HP Data Center Hyperscaler Control
 - 3.17.4 Hewlett Packard Project Synergy Composable Infrastructure Initiative
- 3.18 NTT Raging Wire
- 3.19 Rackspace
 - 3.19.1 Rackspace Power
 - 3.19.2 Rackspace Network
- 3.20 Equinix
 - 3.20.1 HK3 Hong Kong - Data Center
 - 3.20.2 Equinix Supports Diverse And Rapidly Growing International Business Clusters, Rich Industry Ecosystem
 - 3.20.3 Equinix Dublin Metro Facilities
 - 3.20.4 Equinix Brings Online Sixth London Data Center
 - 3.20.5 Equinix Performance Hub
- 3.21 Twitter
- 3.22 Bank of America
- 3.23 Wells Fargo
- 3.24 eBay
- 3.25 Switch SuperNAP
 - 3.25.1 Switch International Expansion

- 3.25.2 Switch Cloud Connectivity Charges Lowered
- 3.25.3 Switch SUPERNAP High Density Designs
- 3.25.4 Red Hat Ansible
- 3.25.5 Red Hat Ansible Architecture, Agents, And Security
- 3.25.6 Red Hat Ansible Advanced Features
- 3.25.7 Red Hat / Ansible
- 3.26 Cisco

4. HYPERSCALE DATACENTERS RESEARCH AND TECHNOLOGY

- 4.1 Enterprise IT Control Centers
- 4.2 Open Compute Project (OCP),
 - 4.2.1 Microsoft Investment in Open Compute
 - 4.2.2 Microsoft Leverages Open Compute Project to Bring Benefit to Enterprise Customers
- 4.3 Open Source Foundation
 - 4.3.1 OSPF Neighbor Relationship Over Layer 3 MPLS VPN
- 4.4 Equinix Expansion of LD6 International Business Exchange Datacenter
 - 4.4.1 Equinix and Oracle Collaborate to Bring Oracle Cloud Services to Equinix Cloud Exchange in Six Global Markets
 - 4.4.2 Oracle Cloud Platform
- 4.5 Power Management
- 4.6 M2M Industry
- 4.7 Equinix Cloud Exchange Interconnection Solution
- 4.8 System On A Chip (SoCs) for Cloud 2.0 Mega Data Centers
 - 4.8.1 A New Class of Low-Power Server SoCs
 - 4.8.2 Re-Architecting the Network: Software Defined Networks (SDNs)
 - 4.8.3 Synopsys SoCs
 - 4.8.4 Open Network Foundation (ONF) Addresses Need For SoC Lower Power Consumption
- 4.9 Dynamic Systems
 - 4.9.1 Robust, Enterprise-Quality Fault Tolerance
- 4.10 Cache / Queue
- 4.11 Multicast
- 4.12 Performance Optimization
- 4.13 Fault Tolerance
 - 4.13.1 Gateways
 - 4.13.2 Promise Of Web Services
- 4.14 IP Addressing And Directory Management

- 4.14.1 Dynamic Visual Representations
- 4.14.2 Application Integration
- 4.14.3 Point Applications
- 4.14.4 Fault Tolerance and Redundancy Solutions
- 4.14.5 Goldman Sachs Open Compute Project
- 4.15 Robust, Quality Cloud Computing
- 4.16 Networking Performance
- 4.17 Data Center Bandwidth Pricing:

5. HYPERSCALE DATACENTERS COMPANY PROFILES

- 5.1 365 Data Centers
- 5.2 Amazon
 - 5.2.1 Amazon Business
 - 5.2.2 Amazon Competition
 - 5.2.3 Amazon Description
 - 5.2.4 Amazon Revenue
- 5.3 Apple
 - 5.3.1 Apple / AuthenTec
 - 5.3.2 Authentec Revenue Recognition – Smart Sensors
 - 5.3.3 Apple
 - 5.3.4 Apple Business Strategy
 - 5.3.5 Apple Products
 - 5.3.6 Apple iPhone
 - 5.3.7 Apple Mac Hardware Products
 - 5.3.8 Apple iPod
 - 5.3.9 Apple iTunes
 - 5.3.10 Apple Mac App Store
 - 5.3.11 Apple iCloud
 - 5.3.12 Apple Software Products and Computer Technologies
 - 5.3.13 Apple Operating System Software iOS
 - 5.3.14 Apple Mac OS X
 - 5.3.15 Apple Third-Largest Mobile Phone Maker
 - 5.3.16 Apple Revenue
 - 5.3.17 Apple Regional Segment Operating Performance
 - 5.3.18 Apple Net Sales
 - 5.3.19 Apple iPhone Shipments
 - 5.3.20 Apple iPad Shipments
 - 5.3.21 Apple Revenue

5.4 Alibaba

5.4.1 Alibaba Cloud Expands Data Centers, Steps Up Challenge to Amazon, Microsoft

5.4.2 Alibaba Cloud Unit has 2.3 Million Customers

5.4.3 Alibaba Seeks To Leverage Applications Integration via Automated Cloud

Processes

5.4.4 Alibaba Cloud Middle East

5.4.5 Alibaba Cloud Europe

5.4.6 Alibaba Cloud Australia

5.4.7 Alibaba Cloud Japan

5.5 Baidu

5.5.1 Baidu Platform

5.5.2 Baidu Mobile Era Cloud, Mobile Search

5.5.3 Baidu, The Largest Chinese Search Engine

5.5.4 Baidu Self-Designed 10Gb TOR Switch

5.5.5 Baidu ARM on a Large Scale

5.5.6 Baidu Self-Designed SSD

5.5.7 Baidu Customized Rack Servers

5.5.8 Baidu Buys Modular Data Center From Schneider

5.6 Chef

5.6.1 Chef Customers

5.6.1 Chef Partner Ecosystem Includes AWS, Dell, and Rackspace

5.6.2 Chef Compliance, Workflow, and Automation Support

5.6.3 Chef Professional DevOps Practice Service Partners

5.6.4 Chef Technology Partners Build World-Class Integrations with Chef

5.6.5 Chef Value Added Resellers

5.7 China Building A Cloud Computing Complex

5.8 China Mobile

5.9 Colocation America Data Center Bandwidth and Measurements

5.10 Colo-D

5.10.1 Colo-D Strong Growth Opening Of A Second Cloud 2.0 mega data center In Quebec In 2016

5.11 CoreSite

5.11.1 CoreSite Cloud Data Center Leasing Accelerates

5.11.2 Key Markets Update

5.12 CyrusOne

5.13 Digital Realty

5.14 Docker

5.15 DuPont Fabros Technology

5.15.1 DuPont Fabros Technology Customer Analysis

5.15.2 DuPont Fabros Operating Portfolio: Tier 1 Markets

5.16 Edge ConneX

5.16.1 EdgeConneX Hyperscale Cloud Anchor

5.16.2 EdgeConneX Disrupts Incumbent Data Center Providers

5.16.3 EdgeConneX 'Disruptive Network Positioning

5.16.4 EdgeConneX – US Strategy

5.16.5 Edge Data Center Providers Changing the Internet's Geography

5.16.6 EdgeConneX Building at the Internet Edge

5.16.7 EdgeConneX Demand Dynamics

5.16.8 EdgeConneX Funding

5.16.9 EdgeConneX Software Supports Speed to Market

5.16.10 EdgeConneX Cloud Strategy

5.16.11 EdgeConneX in Europe

5.16.12 Liberty Global Anchor Tenant in London

5.17 Equinix

5.17.1 EQUINIX, INC. Revenues

5.17.2 Equinix Purchase of Digital Realty Trust

5.17.3 Equinix Acquisition of TelecityGroup

5.18 Facebook

5.18.1 Facebook Technology

5.18.2 Facebook Sales and Operations

5.18.3 Facebook Management Discussion

5.18.4 Facebook Revenue

5.18.5 Facebook

5.18.6 Facebook App Draining Smart Phone Batteries

5.18.7 Facebook Messaging Provides Access to User Behavioral Data

5.18.8 Facebook Creating Better Ads

5.18.9 Facebook Next Generation Services

5.18.10 Facebook Platform

5.18.11 Facebook Free Basics

5.18.12 Facebook AI

5.18.13 Facebook Revenue

5.18.14 Facebook Revenue Growth Priorities:

5.18.15 Facebook Average Revenue Per User ARPU

5.18.16 Facebook Geographical Information

5.18.17 Facebook WhatsApp

5.18.18 Facebook WhatsApp Focusing on Growth

5.19 Forsythe

5.19.1 Forsythe Data Centers An Adaptable Facility to Meet Clients' Evolving Needs

- 5.19.2 Forsythe Data Centers All-Encompassing Network
- 5.20 Google
 - 5.20.1 Google Revenue
 - 5.20.2 Google
 - 5.20.3 Google Search Technology
 - 5.20.4 Google Recognizes World Is Increasingly Mobile
 - 5.20.5 Google Nest
 - 5.20.6 Google / Nest Protect
 - 5.20.7 Google / Nest Safety History
 - 5.20.8 Google / Nest Learning Thermostat
 - 5.20.9 Google Chromecast
- 5.21 Hewlett Packard Enterprise
- 5.22 IBM
 - 5.22.1 IBM Strategy
 - 5.22.2 IBM Cloud Computing
 - 5.22.3 IBM Business Model
 - 5.22.4 IBM Solutions
 - 5.22.5 IBM Blockchain
 - 5.22.6 IBM PureData System for Transaction Analysis
 - 5.22.7 IBM Business Partners
 - 5.22.8 IBM Messaging Extension for Web Application Pattern
 - 5.22.9 IBM MobileFirst
 - 5.22.10 IBM Business Analytics and Optimization Strategy
 - 5.22.11 IBM Growth Market Initiatives
 - 5.22.12 IBM Business Analytics and Optimization
 - 5.22.13 IBM Strategy Addresses Volatility of Information Technology (IT) Systems
 - 5.22.14 IBM Smarter Planet
 - 5.22.15 IBM Business Revenue Segments And Capabilities
 - 5.22.16 IBM Software Capabilities
- 5.23 Intel
 - 5.17.1 Intel Business
 - 5.23.2 Intel Company Strategy
 - 5.23.3 Intel In The Internet Of Things Market Segment
 - 5.23.4 Intel Competitive Advantages
- 5.24 I/O
- 5.25 InterXion
 - 5.25.1 Interxion Revenue
- 5.26 Mesosphere
 - 5.26.1 Modern App Platform Services

- 5.26.2 Mesosphere Enterprise DC/OS Hybrid cloud independence
- 5.26.3 Mesosphere / Open Source Mesos Tool
- 5.26.4 Modern Enterprise Applications Use Of Open Source Software
- 5.26.5 Banding Together To Deliver Mesosphere Containers And Stateful DC/OS
- 5.26.6 Mesosphere DC/OS: Mesos
- 5.26.7 Heart of DC/OS Mesos
- 5.26.8 DC/OS Implements Containers
- 5.26.9 DC/OS Available Services as Packages Included in Universe
- 5.26.10 Mesosphere Customers
- 5.27 Microsoft
 - 5.27.1 Microsoft Builds the Intelligent Cloud Platform
 - 5.27.2 Microsoft Targets Personal Computing
 - 5.27.3 Microsoft Reportable Segments
 - 5.27.4 Skype and Microsoft
 - 5.27.5 Microsoft / Skype / GroupMe Free Group Messaging
 - 5.27.6 Microsoft SOA
 - 5.27.7 Microsoft .Net Open Source
 - 5.27.8 Microsoft Competition
 - 5.27.9 Microsoft Revenue
- 5.28 US National Security Agency
- 5.29 NEC
 - 5.29.1 NEC Revenue
 - 5.29.2 NEC Leading Company In Small Cell Solutions
 - 5.29.3 NEC Business Outline
- 5.30 NTT / RagingWire
 - 5.30.1 RagingWire Data Centers
 - 5.30.2 RagingWire Best Practice Approach to Data Center Colocation
 - 5.30.3 RagingWire Joined NTT
- 5.31 OpenStack Cloud Controller
 - 5.31.1 OpenStack Has Created Its Own APIs
 - 5.31.2 How Many Openstack Clouds Have Been Deployed
 - 5.31.3 OpenStack Functions
 - 5.31.4 OpenStack Regional Market
 - 5.31.5 OpenStack Collaboration with Industry
 - 5.31.6 OpenStack Cloud Service Context
 - 5.31.7 OpenStack Industry Presence
 - 5.31.8 Storage Innovations Drive OpenStack
- 5.32 Puppet
 - 5.32.1 Puppet: Standard platform.

- 5.32.2 Puppet Customers
- 5.32.3 Puppet Open Source Software
- 5.32.4 Puppet Orchestrator
- 5.32.5 Puppet Project Blueshift
- 5.33 QTS
 - 5.33.1 QTS History
 - 5.33.2 QTS Chicago Data Center
- 5.34 Qualcomm
 - 5.34.1 Qualcomm
 - 5.34.2 Qualcomm Business
 - 5.34.3 QMC Offers Comprehensive Chipset Solutions
 - 5.34.4 Qualcomm Government Technologies
 - 5.34.5 Qualcomm Internet Services
 - 5.34.6 Qualcomm Ventures
 - 5.34.7 Qualcomm Revenue
 - 5.34.8 Qualcomm / WiPower
- 5.35 Rackspace
- 5.36 Red Hat / Ansible
- 5.37 Switch
 - 5.37.1 Switch SUPERNAP CORE Cooperative: \$3 Trillion Independent Purchasing And Collaboration Ecosystem
 - 5.37.2 Switch SUPERNAP Edge
- 5.38 Tango
- 5.39 Tencent
 - 5.39.1 TenCent Revenue
 - 5.39.2 Tencent Revenues
 - 5.39.3 Tencent Holdings Has a Partnership With Glu
 - 5.39.4 Tencent WeChat
- 5.40 Twitter
 - 5.40.1 Twitter Revenue
 - 5.40.2 Twitter Creation And Sharing Ideas And Information
 - 5.40.3 Bringing Tweets To People
- 5.17 Yahoo
 - 5.17.1 Yahoo Revenue
 - 5.17.2 Yahoo Mavens Revenue
 - 5.17.3 Yahoo Tumblr
 - 5.17.4 Yahoo Tumblr Sponsored Posts
 - 5.17.5 Yahoo Tumblr Sponsored Day
 - 5.17.6 Yahoo Tumblr Use Case

5.17.7 Yahoo Display Revenue

5.17.8 Yahoo Display Metrics

5.17.9 Yahoo / Microsoft

5.17.10 Yahoo / Google

5.17.11 Yahoo / Tumblr

Wintergreen Research,

WinterGreen Research Research Methodology

List of Figures

Figure 1. Cloud 2.0 Mega Data Center Market Driving Forces

Figure 2. Cloud Datacenter, Co-Location, and Social Media Revenue Market Shares, Dollars, Worldwide, 2016, Image

Figure 3. Cloud 2.0 Mega Datacenter Market Forecast, Dollars, Worldwide, 2017-2023

Figure 4. RagingWire Colocation N+1 Shared Infrastructure

Figure 5. RagingWire Colocation N+1 Dedicated Infrastructure

Figure 6. RagingWire Data Center Maintenance on N+1 Dedicated System Reduces Fault Tolerance to N

Figure 7. RagingWire Data Center Stays Fault Tolerant During Maintenance with 2N+2 System

Figure 8. Global Digital Information Created and Shared 2005-2015

Figure 9. 100 Gbps Adoption

Figure 10. Data Center Technology Shifting

Figure 11. Data Center Technology Shift

Figure 12. IT Cloud Evolution

Figure 13. Facebook Networking Infrastructure Fabric

Figure 14. Datacenter Metrics

Figure 15. Cloud 2.0 Mega Data Center Market Driving Forces

Figure 16. Cloud Datacenter, Co-Location, and Social Media Revenue Market Shares, Dollars, Worldwide, 2016, Image

Figure 17. Cloud Datacenter, Co-Location, and Social Media Revenue Market Shares, Dollars, Worldwide, 2016

Figure 18. Cloud 2.0 Mega Datacenter Cap Ex Spending Market Shares Dollars, Worldwide, 2016

Figure 19. Large Internet Company Cap Ex Market Shares, Dollars, Worldwide, 2013 to 2016

Figure 20. Cloud 2.0 Mega Data Center Cap Ex Market Shares, Dollars, Worldwide, 2013 to 2016

Figure 21. Cloud 2.0 Mega Data Center Cap Ex Market Shares, Dollars, Worldwide,

2016

Figure 22. Cloud 2.0 Mega Data Center Social Media and Search Revenue Market Shares, Dollars, 2016, Image

Figure 23. Cloud 2.0 Mega Data Center Social Media and Search Revenue Market Shares, Dollars, 2016

Figure 24. Big Eight Hyperscaler Cloud Providers

Figure 25. Supernap, Las Vegas, 407,000 sf

Figure 26. DuPONT FABROS CH1, ELK GROVE VILLAGE, Ill. 485,000 SF

Figure 27. 538,000SF: i/o Data Centers and Microsoft Phoenix One, Phoenix, Ariz.

Figure 28. Phoenix, Arizona i/o Data Center Design Innovations

Figure 29. Next Generation Data Europe, Wales 750,000 SF

Figure 30. NAP Of The Americas, Miami, 750,000 SF

Figure 31. QTS Metro Data Center, Atlanta, 990,000 SF

Figure 32. 350 East Cermak, Chicago, 1.1 Million Square Feet

Figure 33. Data Center Multiple-Facility Campuses Feature Half Million SF

Figure 34. Microsoft Data Center, Dublin, 550,000 Sf

Figure 35. Container Area In The Microsoft Data Center In Chicago

Figure 36. An aerial view of the Microsoft data center in Quincy, Washington

Figure 37. . Microsoft San Antonio Data Centers, 470,000 SF

Figure 38. Microsoft 3rd Data Center in Bexar Could Employ 150

Figure 39. Cloud 2.0 Mega Datacenter Market Forecast, Dollars, Worldwide, 2017-2023

Figure 40. Cloud 2.0 Mega Datacenter Market Shares Dollars, Forecast, Worldwide, 2017-2023,

Figure 41. Cloud 2.0 Mega Datacenter Market Shares Percent, Forecast, Worldwide, 2017-2023

Figure 42. Hyperscale Data Centers

Figure 43. Market Driving Forces for Cloud 2.0 Mega Data Centers

Figure 44. Market Challenges of Cloud 2.0 Mega Data Centers

Figure 45. Data Center Size Definition

Figure 46. Data Center Density Definitions

Figure 47. Carrier-Neutral Colocation Vendors

Figure 48. DuPont Fabros Technology 450,000 square feet, ACC7 in Ashburn, VA Large Data Center

Figure 49. Ten Largest Data Centers

Figure 50. Cloud 2.0 mega data center Open Compute Project OCP ASIC Switch Vendors

Figure 51. Global Data Center Rack Market Key Vendors

Figure 52. Global Data Center Rack Market Company Participants

Figure 53. Key Components And Topology Of A Mega Datacenter

- Figure 54. Datacenter Topology without Single Managed Entities
- Figure 55. Key Challenges Enterprise IT Datacenters:
- Figure 56. Software Defined Datacenter
- Figure 57. Cloud Automation Vendors
- Figure 58. Cisco VNI Forecast Overview
- Figure 59. The Cisco VNI Forecast—Historical Internet Context
- Figure 60. Global Devices and Connections Growth
- Figure 61. Average Number of Devices and Connections per Capita
- Figure 62. Global IP Traffic by Devices
- Figure 63. Global Internet Traffic by Device Type
- Figure 64. Global 4K Video Traffic
- Figure 65. Global IPv6-Capable Devices and Connections Forecast 2015–2020
- Figure 66. Projected Global Fixed and Mobile IPv6 Traffic Forecast 2015–2020
- Figure 67. Global M2M Connection Growth
- Figure 68. Global M2M Connection Growth by Industries
- Figure 69. Global M2M Traffic Growth: Exabytes per Month
- Figure 70. Global Residential Services Adoption and Growth
- Figure 71. Global IP Traffic by Application Category
- Figure 72. Mobile Video Growing Fastest; Online Video and Digital TV Grow Similarly
- Figure 73. Global Cord Cutting Generates Double the Traffic
- Figure 74. Fixed Broadband Speeds (in Mbps), 2015–2020
- Figure 75. Future of Wi-Fi as Wired Complement
- Figure 76. Global IP Traffic, Wired and Wireless*
- Figure 77. Global Internet Traffic, Wired and Wireless
- Figure 78. Cisco VNI Forecasts 194 EB per Month of IP Traffic by 2020
- Figure 79. Cisco Forecast of Global Devices and Connections Growth
- Figure 80. Hardware Cost Comparison – Mainframe vs. Distributed
- Figure 81. Server and Mainframe Hardware Costs
- Figure 82. 2016 Compute Cost Metrics
- Figure 83. 2016 Compute Hardware Cost Metrics
- Figure 84. Server Transactions Per Watt From Greenway Collaborative
- Figure 85. Server to MIPS Conversion Calculations
- Figure 86. Working Out The Hardware Cost Differential Between Mainframe And Distributed Systems
- Figure 87. Server And Mainframe Hardware Costs
- Figure 88. Benefits of Cloud Computing
- Figure 89. Intel Xeon Processor, 36 Cores, x2Thread Count = 72, Spin 5000 virtual Machines
- Figure 90. Cloud Services Market Shares, Dollars, 2016

- Figure 91. Cloud Services Market Shares Dollars, Worldwide, 2016
- Figure 92. Cloud Services Market Shares Percent, Worldwide, 2016
- Figure 93. Cloud Services, Companies with Measurable Market Shares, Dollars and Percent, Worldwide, 2016
- Figure 94. Cloud 2.0 Mega Data Center Regional Market Segments, Dollars, 2016, Image
- Figure 95. Cloud 2.0 Mega Data Center Regional Market Segments, Dollars, 2016
- Figure 96. Data Center Supply in Selected US Regions
- Figure 97. Chicago Data Center Market
- Figure 98. Digital Realty Trust Lakeside Technology Center
- Figure 99. Digital Realty Trust Lakeside Technology Center Hallway Gothic architecture
- Figure 100. Digital Realty Trust Lakeside Technology Center Industrial-Strength Power And Fiber Infrastructure
- Figure 101. Map of Google's Cloud Data Centers
- Figure 102. Amazon Zones and Regions
- Figure 103. Amazon AWS Global Cloud Infrastructure
- Figure 104. Amazon (AWS) Support for Global IT Presence
- Figure 105. AWS E Tool Functions
- Figure 106. AWS E Tool Supported Sources
- Figure 107. Amazon North America Map
- Figure 108. Amazon North America List of Locations
- Figure 109. Example of AWS Region
- Figure 110. Example of AWS Availability Zone
- Figure 111. Example of AWS Data Center
- Figure 112. AWS Network Latency and Variability
- Figure 113. Amazon (AWS) Regional Data Center
- Figure 114. A Map of Amazon Web Service Global Infrastructure
- Figure 115. Rows of Servers Inside an Amazon (AWS) Data Center
- Figure 116. Facebook DuPont Fabros Technology Ashburn, VA Data Center
- Figure 117. Facebook Altoona Iowa Cloud 2.0 Mega Data Center
- Figure 118. Facebook Cloud 2.0 mega data center in Altoona, Iowa Construction Criteria
- Figure 119. Facebook Fifth Data Center Fort Worth Complex.
- Figure 120. Facebook Altoona Positioning Of Global Infrastructure
- Figure 121. Facebook Back-End Service Tiers And Applications Account for Machine-To-Machine Traffic Growth
- Figure 122. Facebook Back-End Service Tiers And Applications Functions
- Figure 123. Facebook Cluster-Focused Architecture Limitations
- Figure 124. Facebook Clusters Fail to Solve a Networking Limitations

- Figure 125. Facebook Sample Pod: Unit of Network
- Figure 126. Facebook Data Center Fabric Network Topology
- Figure 127. Facebook Network Technology
- Figure 128. Facebook Schematic Fabric-Optimized Datacenter Physical Topology
- Figure 129. Facebook Automation of Cloud 2.0 mega data center Process
- Figure 130. Facebook Creating a Modular Cloud 2.0 mega data center Solution
- Figure 131. Facebook Cloud 2.0 mega data center Fabric High-Level Settings Components
- Figure 132. Facebook Cloud 2.0 mega data center Fabric Unattended Mode
- Figure 133. Facebook Data Center Auto Discovery Functions
- Figure 134. Facebook Automated Process Rapid Deployment Architecture
- Figure 135. Facebook Fabric Automated Process Rapid Deployment Architecture
- Figure 136. Facebook Fabric Rapid Deployment
- Figure 137. Facebook Cloud 2.0 mega data center High Speed Network Implementation Aspects
- Figure 138. Facebook Cloud 2.0 mega data center High Speed Network Implementation Aspects
- Figure 139. Google St. Ghislain, Belgium, Europe Data Center
- Figure 140. Google Dynamic Architecture
- Figure 141. Google Clos Multistage Switching Network
- Figure 142. Google Key Principles Used In Designing Datacenter Networks
- Figure 143. Google Andromeda Cloud Architecture Throughput Benefits
- Figure 144. Google Andromeda Software Defined Networking (SDN)-Based Substrate Functions
- Figure 145. Google Andromeda Cloud High-Level Architecture
- Figure 146. Google Andromeda Performance Factors Of The Underlying Network
- Figure 147. Google Compute Engine Load Balanced Requests Architecture
- Figure 148. Google Compute Engine Load Balancing
- Figure 149. Google Cloud Platform TCP Andromeda Throughput Advantages
- Figure 150. Google Meta Data Center Locations
- Figure 151. Google Meta Data Center Locations Map
- Figure 152. Google Dalles Data Center Cooling Pipes
- Figure 153. Google Hamina, Finland Data Center
- Figure 154. Google Lenoir Data Center North Carolina, US
- Figure 155. Google Data Center in Pryor, Oklahoma
- Figure 156. Google Douglas County, Georgia Data Center Facility
- Figure 157. Google Berkeley County, South Carolina, Data Center
- Figure 158. Google Council Bluffs Iowa Cloud 2.0 Mega Data Center
- Figure 159. Google Council Bluffs Iowa Cloud 2.0 Mega Data Center Campus Network

Room

Figure 160. Google Douglas County Cloud 2.0 Mega Data Center

Figure 161. Google Team of Technical Experts Develop And Lead Execution Of' Global Data Center Sustainability Strategy

Figure 162. Google Datacenter Manager Responsibilities

Figure 163. Google Meta Data Center

Figure 164. Google Server Warehouse in Former Paper Mill

Figure 165. Google Data Center in Hamina, Finland

Figure 166. Google Traffic Generated by Data Center Servers

Figure 167. Google Cloud 2.0 mega data center Multipathing: Implementing Lots And Lots Of Paths Between Each Source And Destination

Figure 168. Google Cloud 2.0 mega data center Multipathing: Routing Destinations

Figure 169. Google Builds Own Network Switches And Software

Figure 170. Google Clos Topology Network Capacity Scalability

Figure 171. Google Jupiter Network Delivers 1.3 Pb/Sec Of Aggregate Bisection Bandwidth Across A Datacenter

Figure 172. Jupiter Superblock Collection of Jupiter Switches Running SDN Stack Based On Openflow Protocol:

Figure 173. Google Modernized Switch, Server, Storage And Network Speeds

Figure 174. Google Container Controller Positioning

Figure 175. Google Data Center Efficiency Measurements

Figure 176. Google Data Center PUE Measurement Boundaries

Figure 177. Google Continuous PUE Improvement with Quarterly Variation, 2008 to 2017

Figure 178. Cumulative Corporate Renewable Energy Purchasing in the United States, Europe, and Mexico, November 2016

Figure 179. Images for Microsoft Dublin Cloud 2.0 Mega Data Center

Figure 180. Microsoft Azure Data Center

Figure 181. Microsoft Dublin Cloud 2.0 mega data center

Figure 182. Microsoft .Net Dynamic Definition of Reusable Modules

Figure 183. Microsoft .NET Compiling Source Code into Managed Assemblies

Figure 184. Microsoft Architecture Dynamic Modular Processing

Figure 185. Microsoft-Azure-Stack-Block-Diagram

Figure 186. Microsoft-Azure-Platform Stack-Services

Figure 187. Figure 175. Microsoft-Cloud Virtual Machine -Platform Stack-Services

Figure 188. Microsoft-Azure-Core Management-Services

Figure 189. Microsoft Data Centers

Figure 190. QTS Multi Tenant Data Center Outsourcing Benefits

Figure 191. IBM Cloud Managed Services for z Systems

- Figure 192. IBM Cloud Managed Services for z Systems Functions
- Figure 193. IBM Cloud Managed Services Features
- Figure 194. IBM Cloud Managed Services on z Systems Benefits
- Figure 195. Linux-Based Solutions Under IBM z/VM Shared Infrastructure Support Hybrid Workloads
- Figure 196. IBM Cloud Managed Services on z Systems Features
- Figure 197. IBM Cloud Managed Services on z Systems Functions
- Figure 198. IBM and CA Security Management Products For Mainframes
- Figure 199. IBM Mainframe Regulatory Compliance Support
- Figure 200. IBM Cloud Managed Services on z Systems
- Figure 201. IBM Cloud Managed Services on z Systems—Linux
- Figure 202. IBM i American Airlines Cloud Partnership Functions
- Figure 203. IBM Model z13 Computer Features
- Figure 204. Pipeline Has An Instruction Queue
- Figure 205. IBM Model z13 Computer Configuration
- Figure 206. DuPont Fabros ACC Data Center Technology
- Figure 207. Data Center Market MW Availability
- Figure 208. Wholesale Data Center MW Availability Definition
- Figure 209. Wholesale Data Center Consolidated MW Trends
- Figure 210. Wholesale Data Center MW Commissioned Growth
- Figure 211. Retail Data Center Colocation Churn is Increasing
- Figure 212. DuPont Fabros Technology Portfolio Competition
- Figure 213. Data Center Key Metrics
- Figure 214. Hewlett Packard Composable Data Center Infrastructure
- Figure 215. Hewlett Packard Project Synergy Composable Infrastructure Initiative
- Figure 216. NTT RagingWire Data Centers Image
- Figure 217. NTT Mission Critical IT Systems Features
- Figure 218. NTT RagingWire Highly Customizable Colocation Solutions Features
- Figure 219. NTT Ragingwire Data Centers Facilities Location, Power, and Cooling Features
- Figure 220. NTT Ragingwire Data Centers Facilities Security Functions
- Figure 221. RagingWire Wholesale Data Center Campuses:
- Figure 222. NTT RagingWire Ashburn Va2 Data Center
- Figure 223. Rackspace Hosting Provider Functions
- Figure 224. Equinix LD6 data center in Slough, England
- Figure 225. IBX Data Center Locations
- Figure 226. Equinix Dublin Metro Data Centers
- Figure 227. Equinox Dublin Metro Data Center
- Figure 228. Equinox Dublin Data Center Server Racks

- Figure 229. Equinix Asia Pacific Data Centers
- Figure 230. Equinix IBX Data Center Features
- Figure 231. Equinix IBX Data Center Functions:
- Figure 232. Equinix Connections and Interconnections
- Figure 233. Equinix Data Center Image
- Figure 234. Equinix Data Center Features
- Figure 235. eBay Cloud 2.0 mega data center
- Figure 236. Switch SuperNAP Synoptek Advanced Data Center
- Figure 237. Switch Synoptek Data Center Advantages
- Figure 238. Switch Synoptek Hosting Facilities Advantages
- Figure 239. SuperNAP SSAE16 Type II Certified Facility Features
- Figure 240. Switch Synoptek Power Advantages
- Figure 241. Switch SuperNap Facilities Aspects:
- Figure 242. Switch SUPERNAP Data Center High Density Racks
- Figure 243. Switch SUPERNAP High Density Data Center
- Figure 244. Red hat Ansible Playbook Language Advanced Features
- Figure 245. Cisco UCS Director Delivers Comprehensive Infrastructure Management and Orchestration
- Figure 246. Multiple Pathways Open To Processing Nodes In The Cloud 2.0 Mega Data Center Functions
- Figure 247. Layer 3 MPLS VPN Backbone
- Figure 248. OSPF Network Types
- Figure 249. Cloud 2.0 Mega Data Centers Are Demanding Significant Amounts Of Power And Network Management
- Figure 250. Reducing Power With Micro Server SoCs
- Figure 251. Software Stack, Standard Platforms, Simplified Network Architecture, Reduces Network Management Costs
- Figure 252. Data center SoC architecture
- Figure 253. Simplifying the Data Center Network with SDN
- Figure 254. Simplifying the Data Center Network
- Figure 255. Data Center Network SDN Functions
- Figure 256. Synopsys DesignWare IP Portfolio Features
- Figure 257. Figure 168. Synopsys DesignWare IP Portfolio Modules
- Figure 258. Data Center SoC Architecture Incorporating Synopsys DesignWare IP Attributes
- Figure 259. Automatic Detection And Recovery From Network And System Failure
- Figure 260. High Performance And Real-Time Message Throughput
- Figure 261. Fault Tolerance Features
- Figure 262. Functions Of An IP Addressing Device

- Figure 263. Benefits Of an IP Addressing Device
- Figure 264. Dynamic Visual Representation System Uses
- Figure 265. Application Integration Health Care Functions
- Figure 266. Application Integration Industry Functions
- Figure 267. CERNE Cloud Architecture
- Figure 268. Cern Cloud and Dev
- Figure 269. CERN Use Cases
- Figure 270. Cern Hardware Spectrum
- Figure 271. Open Stack at Cern
- Figure 272. Cern Open Space Containeers on Clouds
- Figure 273. 365 Data Centers Products & Services
- Figure 274. Amazon Principal Competitive Factors In The Online Retail Business
- Figure 275. Amazon Improving Customer Experience Functions
- Figure 276. Amazon Ways To Achieve Efficiency In Technology For Operations
- Figure 277. Alibaba Applications Integration Automated Cloud Processes
- Figure 278. Baidu Search and Information
- Figure 279. Baidu Range Of Energy Saving Methods And Technologies
- Figure 280. Key Benefits of AWS OpsWorks for Chef Automate
- Figure 281. Chef Automate Builds On Widely Adopted Open-Source Projects:
- Figure 282. Chef Automate Solution for Automating the Technology Stack
- Figure 283. Chef Automate Block Diagram
- Figure 284. Chef Professional DevOps Practice Service Partners
- Figure 285. Technology Partners Build World Class Integrations With Chef To Accelerate And Compliment Their Platforms With Automation
- Figure 286. Chef Value Added Resellers (VARs)
- Figure 287. Chef Open Source And Commercial Automation Platforms
- Figure 288. Digital Realty Trust Metropolitan Area Percentage of September 30, 2016
Total Annualized Rent
- Figure 289. Docker Challenges and Solutions
- Figure 290. DuPont Fabros Wholesale Data Center Characteristics
- Figure 291. DFT Development Plan
- Figure 292. DuPont Fabros Triple-Net Leases
- Figure 293. DuPont Fabros Technology Data Center Locations
- Figure 294. DuPont Fabros Key Strategic Initiatives
- Figure 295. DuPont Fabros Base Rent Trends
- Figure 296. DuPont Fabros Key Operating Metrics – Leasing / Renewals
- Figure 297. DuPont Fabros Occupancy Trends
- Figure 298. DuPont Fabros Technology Operating Portfolio: Tier 1 Markets
- Figure 299. DuPont Fabros Annual Revenue

- Figure 300. EdgeConneX Data Centers Positioned at the Edge
- Figure 301. EdgeConneX Edge Data Centers North America and Europe
- Figure 302. Equinix Global Regional Segment Revenue, Three Months 2016
- Figure 303. Equinix Global Co Location Data Centers
- Figure 304. Google / Nest Learning Thermostat
- Figure 305. IBM PureSystems Target Industries
- Figure 306. Mesosphere Target Applications
- Figure 307. Cloud-Native Building Blocks Change Delivery Of Apps
- Figure 308. Mesosphere DC/OS: Mesos Features:
- Figure 309. Microsoft Productivity and Business Processes Segment
- Figure 310. Microsoft Intelligent Cloud Segment
- Figure 311. Microsoft / Skype / GroupMe Free Group Messaging
- Figure 312. Microsoft Service Orientated Architecture SOA Functions
- Figure 313. Ragingwire Wholesale Data Center Campuses:
- Figure 314. OpenStack Cloud at CERN
- Figure 315. Open Stack Deployments
- Figure 316. QTS Chicago Data Center
- Figure 317. QTS Chicago Data Center Inside Raised Floor
- Figure 318. Rackspace London
- Figure 319. Rackspace Global Infrastructure
- Figure 320. Red Hat Ansible Tower 3 Job Run Metrics

I would like to order

Product name: Hyperscale Data Centers: Market Shares, Strategies, and Forecasts, Worldwide, 2017 to 2023

Product link: <https://marketpublishers.com/r/H97B716572BEN.html>

Price: US\$ 4,200.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/H97B716572BEN.html>

To pay by Wire Transfer, please, fill in your contact details in the form below:

First name:
Last name:
Email:
Company:
Address:
City:
Zip code:
Country:
Tel:
Fax:
Your message:

****All fields are required**

Customer signature _____

Please, note that by ordering from marketpublishers.com you are agreeing to our Terms & Conditions at <https://marketpublishers.com/docs/terms.html>

To place an order via fax simply print this form, fill in the information below and fax the completed form to +44 20 7900 3970

