2016



AII

2017 7


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1.ONS 11

1.1 ONS 11

1.2 ONS 12

1.3 ONS 12

1.4 ONS 13

2.Handle 13

2.1 Handle 13

2.2 Handle 14

2.3 Handle 14

2.4 Handle 15

3.OID 15

3.1 OID 15

3.2 OID 16

3.3 OID 17

3.4 OID RFID 18

4.Ecode 18

4.1 Ecode 2013 .....

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1 1

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2-1-4 7

2-1-5OPC 8

2-1-6 OPC 9

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2-2-9 Ecode 18

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2-2-10 Ecode .....

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1



1

IT OT

TI OT /



PatentStrategies

2016 [1]

- PROFINET Ethernet/IP

[1] 2015 2016

OPC/OPCUA

- Handle ONS

  ONS Handle

  OID Ecode

- 

1.

1.1

5671

1997

2010

600

2-1-1

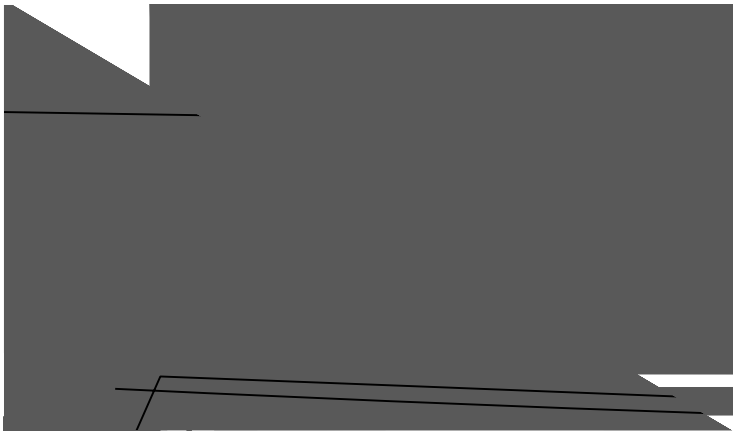
1.2



2-1-2

45% 21%

PROFINET



2-1-3

1573

2001 2011 2015

200 2016

2.2

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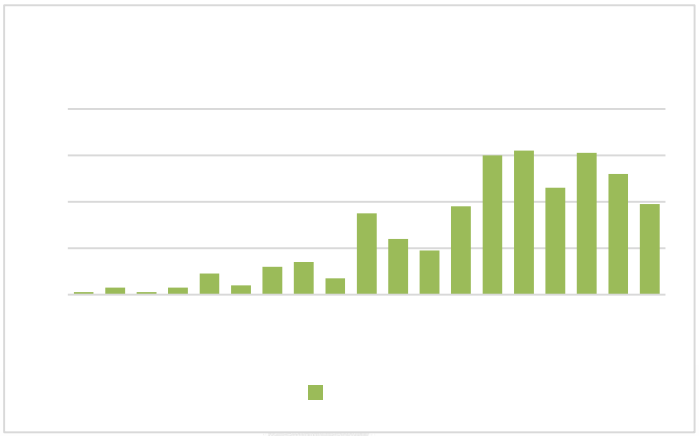
40% 23%


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3.OPC/OPC UA

3.1 OPC/OPC UA 2012

OPC 1998 OPC Windows 1998-2007 OPA UA 2007 40

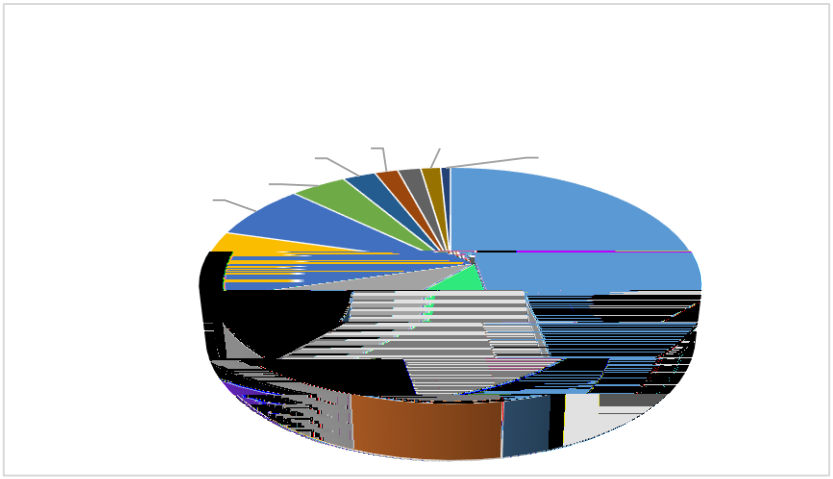


2-1-50PC

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3.2 OPC

47% OPC 14% WIPO OPC OPC OPC UA OPC 2008



2-1-6 OPC

3.3 Siemens ABB OPC

Siemens ABB GE EMERSON FISHER-ROSEMOUNT BOSCH ROCKWEll OPC ABB Siemens OPC

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Siemens ABB

3.4 OPC UA PLC

2008 OPC UA

OPC Classic

OPC 30% OPC UA

2-1-7 OPC OPC UA

OPC UA 2008 ABB OPC UA

OPC

OPC UA Siemens ABB

3.5 OPC UA

OPC UA OPC UA

OPC UA OPC UA

1.ONS

1.1 ONS

2-2-1 ONS

ONS DNS ONS

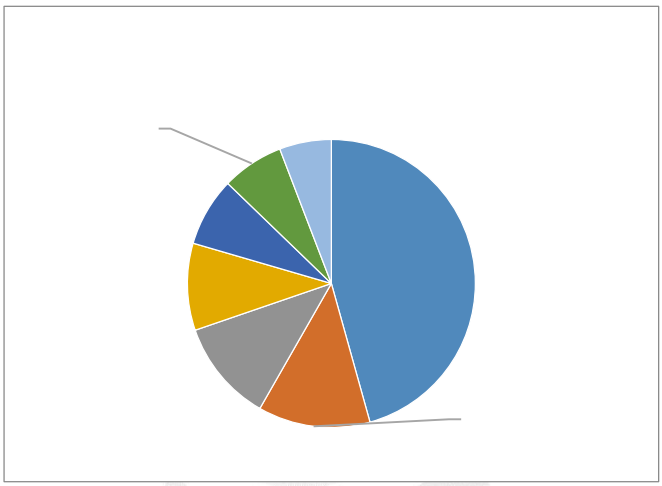
532 257 2005

2-2-2 ONS

ONS 2012 2013

1.2 ONS

ONS



2-2-3 ONS

GE

AT&T IBM (IIC)

1.3 ONS

Cisco

ONS 80 IBM

ONS 70

ONS

1.4 ONS

ONS

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2.2 Handle

Handle

Handle



2-2-5 Handle

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CONTENT DIRECTIONS

AMERICAN EXPRESS TRAVEL RELATE

2.4 Handle

Handle

3.OID

3.1 OID

Object identifier, OID ISO/IEC ITU

OID

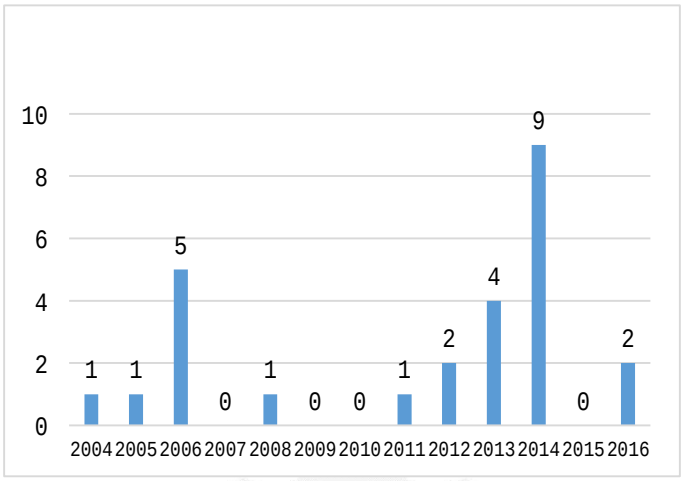
2016 5 , OID 954393 OID

RFID 3GPP

OID 130

56

2-2-6 OID



2-2-7 OID

2015 “ OID ”

ITU-T

OID 26 24

OID 2004 OID

OID

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3.2 OID

OID

ISO ISO-ITU

(JOINT-ISO-ITU-T) ITU-T ISO ISO-ITU

OID

2-2-8 OID

OID 37%

21%

3.3 OID

OID OID

ETRI 14 ULTRATA

12

3.4 OID RFID

OID RFID

OID

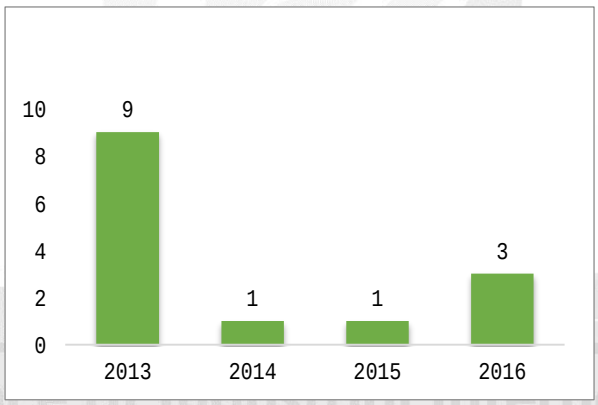
4.Ecode

4.1 Ecode 2013

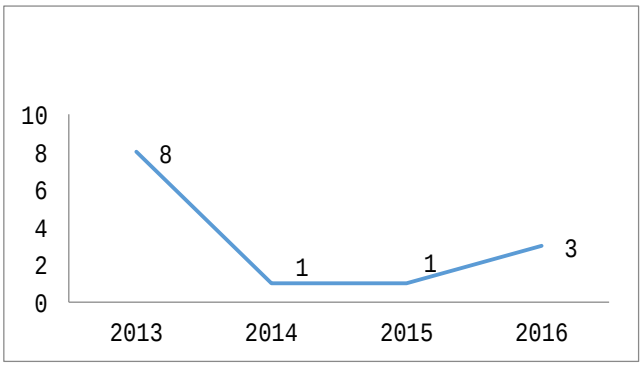
Ecode

Ecode 22 14 Ecode

2013



2-2-9 Ecode



2-2-10 Ecode

Ecode 20 13

Ecode

4.2. Ecode 4. 4.

Ecode Ecode



2-2-11 Ecode и

Ecode

2 Ecode

4.4 Ecode

Ecode

NoSQL

HDFS HAWQ Impala Presto Drill Spark Hive Pheonix

Mathworks SAS SAP VMware Pivotal CloudFoundry

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1.

1.1 NoSQL

NoSQL

NoSQL

1.3 IT

IBM Microsoft NoSQL

NoSQL 7

NoSQL

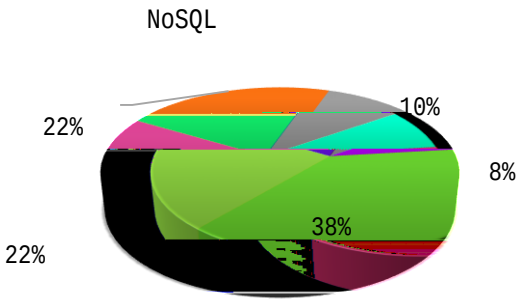
IT

1.4

a.

NoSQL SQL JSON

b.




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Hive	Hadoop SQL Structured Query Language MapReduce MapReduce
Spark	PB Apache Amazon eBay Yahoo Spark Scala Java Python API Hadoop
Imala	Cloudera SQL Hadoop HDFS HBase PB Hive SQL Hive MapReduce Impala
Drill	ANSI SQL HDFS HBase MongoDB Parquet JSON CSV TSV PSV Google Dremel Drill PB

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1PB Airbnb Dropbox Presto
Hadoop SQL NoSQL HAWQ ACID
Saleforce.com Apache java Pheonix NoSQL HBase Phoenix

2.2

2.2.1 HDFS Hive Spark

2009 4000

2629 HDFS Hive Spark

Imala

Drill Presto HAWQ Pheonix

HDFS Hive Spark


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Spark

2009 2016 910

579

Spark **Hive** **MapReduce**

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HAWQ

2.2.2

24%



2-3-6

2.2.3 IBM FACEBOOKD 57>BDC BT1 0 0 1 399.7 2850 1 4240BDC B/F16 14.04


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Hive

Hive

Hadoop

Spark

Spark

Spark

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Pheonix

Pheonix

3. ——

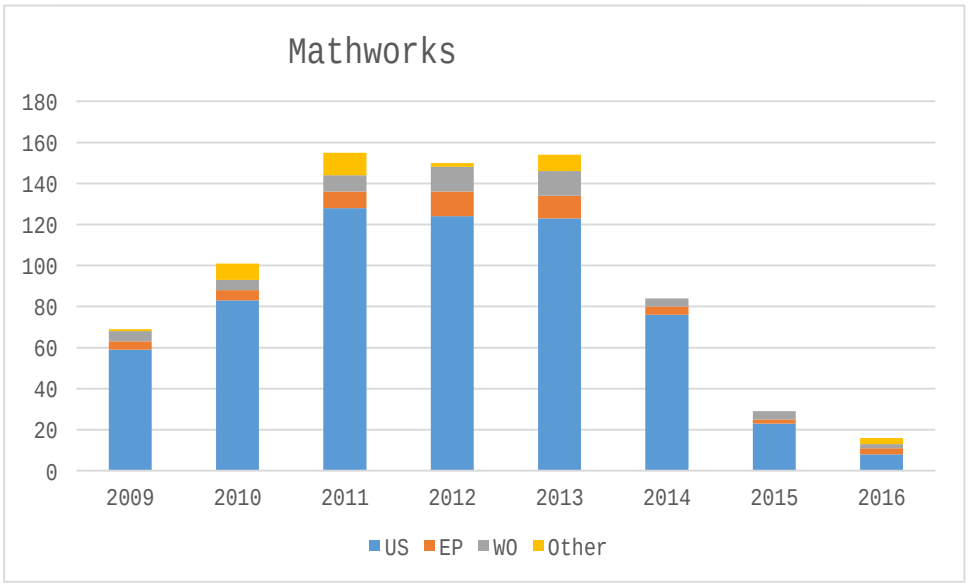
3.1 Mathworks

Mathworks

1679 2009

2011

2013



2-3-7 Mathworks

Mathworks

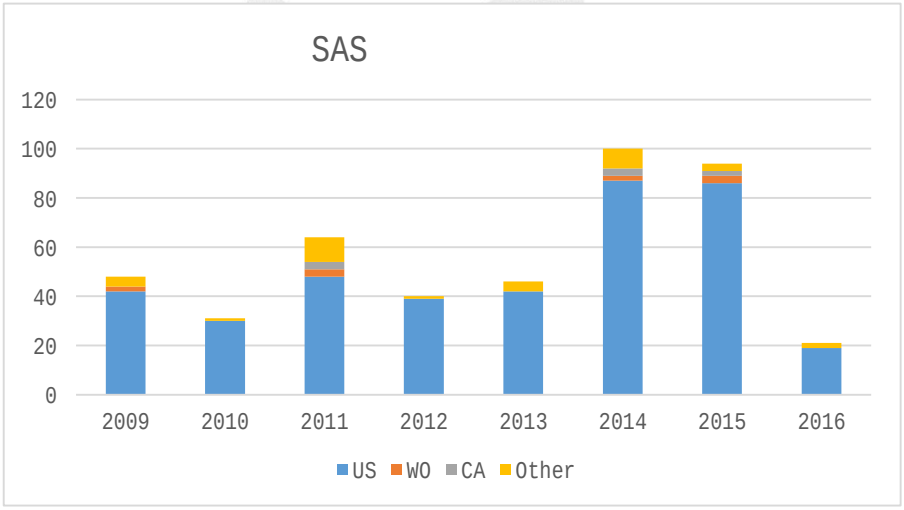
Mathworks

3.2 SAS

SAS

1976 SAS

SAS INSTITUTE INC SAS

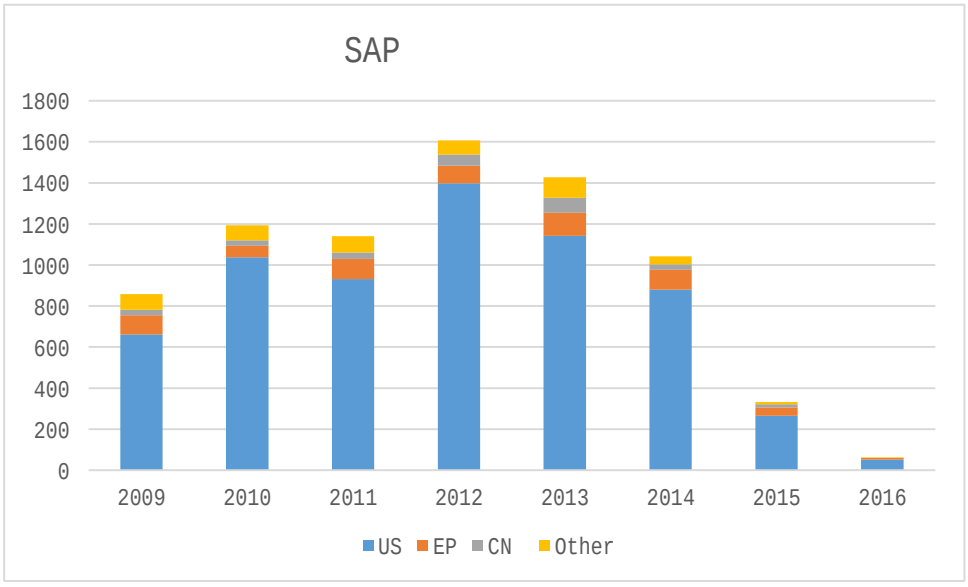


2-3-8 SAS

SAP SAS INSTITUTE INC

694 2009


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2-3-9 SAP

SAP

SAP

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4.

4.1 Pivotal software Cloud Foundry GreenPlum

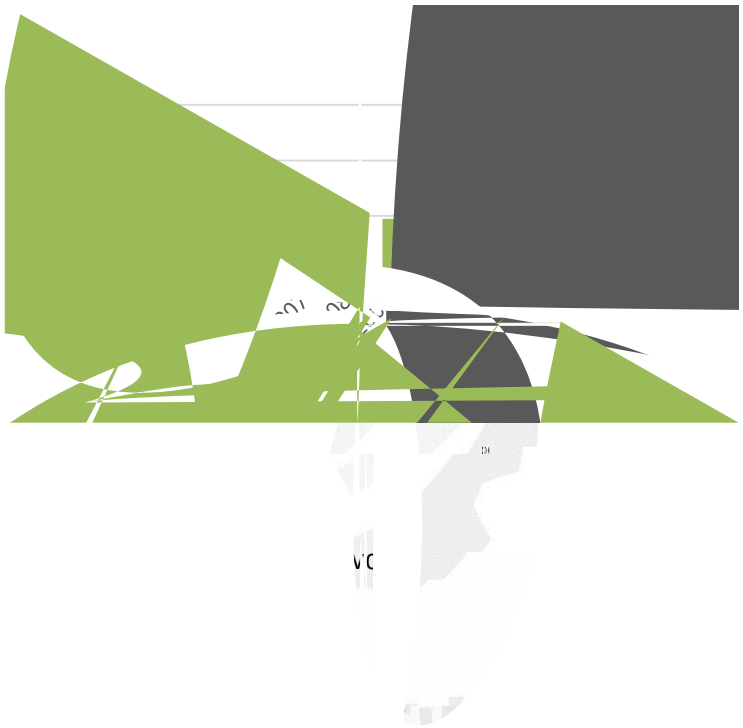
Pivotal software

Pivotal Pivotal One

Pivotal

4.1.1 Pivotal

VMware EMC



Pivotal

2014

40

Pivotal 85% 1%

Pivotal 12306

4.1.3 Pivotal Cloud Foundry GreenPlum

Pivotal 35%

8% 8% 7%

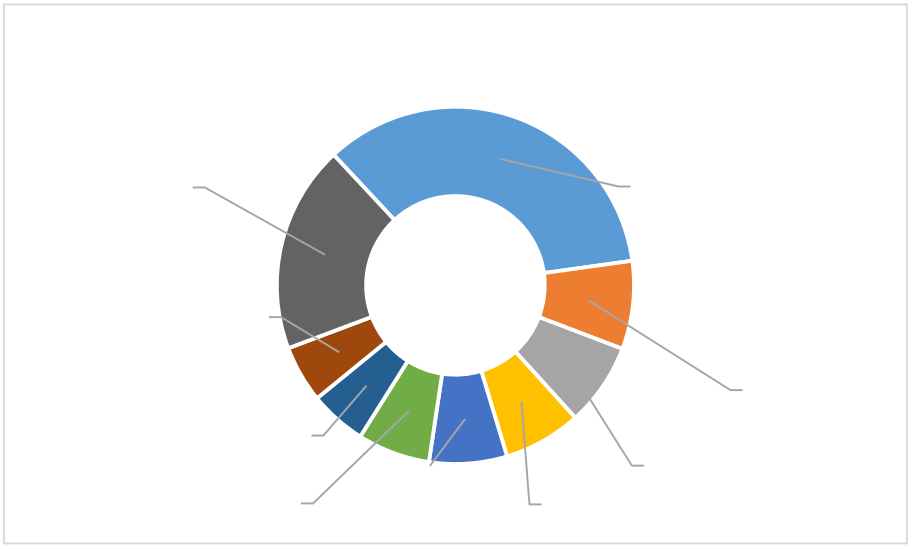
Pivotal

stream processing mirror database

GreenPlum Hadoop GemFire

Spring MySQL Dev Cloud Foundry

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2-3-12 Pivotal IPC

4.2 VMware

VMware

PaaS Cloud Foundry1.0

4.2.1 VMware

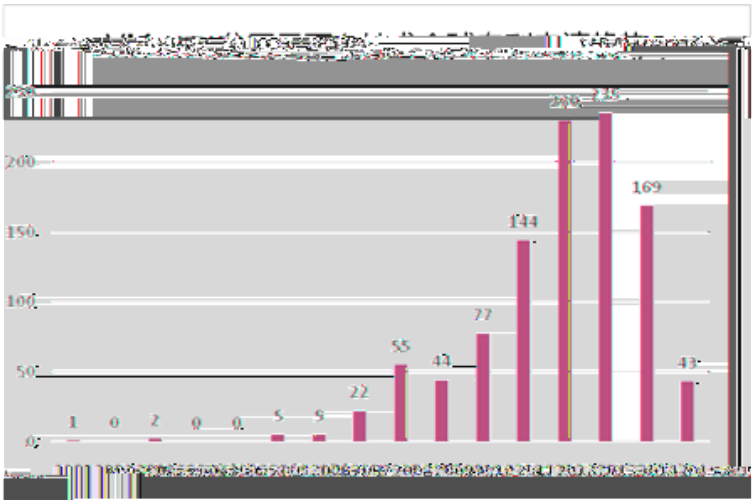
VMware 1032

2001 VMware 2008

VMware

2014 235

VMware



2-3-13 VMware

4.2.2 VMware

VMware 89%

VMware



2-3-14 VMware

VMware


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