

**GLOBAL  
FORUM**  
Shaping the Future  
2010



**Cloud computing**  
**Internet of Things**  
**Smart GRID**  
**Optimised thru IPv6**



*Vision & Way Forward*

# The Internet took a long time to make it!

Hobbes' Internet Timeline Copyright ©2010 Robert H Zakon  
<http://www.zakon.org/robert/internet/timeline/>

**NCP / TCP-IP**

**NCP - 2<sup>8</sup>**

#Hosts

DATE	HOSTS	DATE	HOSTS
12/69	4	10/84	1,024
06/70	9	10/85	1,961
10/70	11	02/86	2,308
12/70	13	11/86	5,089
04/71	23	12/87	28,000
10/72	31	07/88	50,000
01/73	35	10/88	56,000
06/74	62	07/89	130,000
03/77	111	10/89	159,000
12/79	188	10/90	313,000
08/81	213	10/91	617,000
05/82	235	10/92	1,136,000
08/83	562	10/93	2,056,000

**WWW**

**Win 95  
IE**

**IPv6**

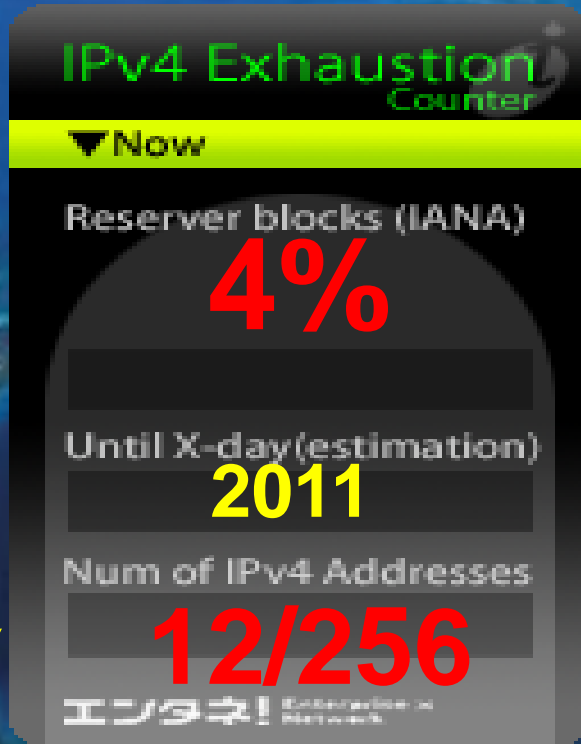
**IPv6 Forum**

Jan-95 Sep-95 May-96 Jan-97 Sep-97 May-98 Jan-99 Sep-99 May-00 Jan-01 Sep-01 May-02 Jan-03 Sep-03 May-04 Jan-05 Sep-05 May-06 Jan-07 Sep-07 May-08 Jan-09 Sep-09

# The IPv4 Address Exhausting Debate ☺



2030



Geoff Huston



2010

Tony Hain



CYRIAK

**All ISPs will have to take off like this!”**

*Anonymous 2010*



# The Next Big Internet

## Smart GRID

Billions of  
Smart Devices  
- Vehicles  
- Buildings

5 Billions  
- Mobile Phones  
- PDAs

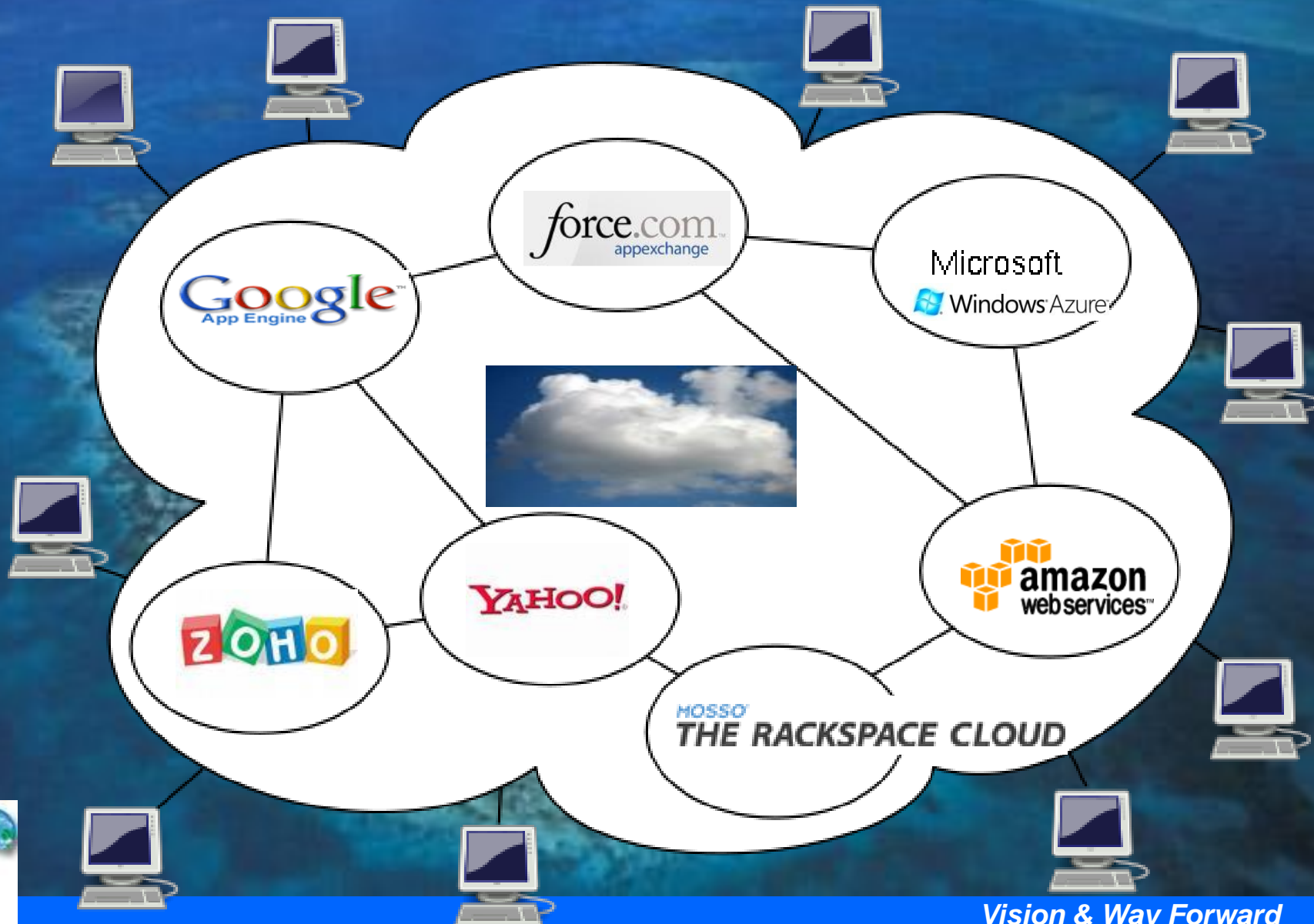
## Internet of Things

Trillions of  
- RFIDs  
- Sensors

650 M  
Nodes

## Cloud Computing

# First Cloud of Cloud Computing



# Cloud Landscape

Application



xignite

It's not the data. It's the delivery.

Platform



Infrastructure



Integration



Operation



THE ENTERPRISE CLOUD COMPANY

# Synergies between CC & IPv6

## Scalability

- ✓ **Massive scalability**
  - Hierarchical internal address space of provider
  - Avoid connection brokers (ALG/NAT)
- ✓ **No “need” for NAT**
- ✓ **Always connected user experience**  
Mobile IPv6
- ✓ **Customer connectivity**
- ✓ **“Easier” implementation**
- ✓ **Unified Communications**

- ✓ **Large number of virtual interfaces**
- ✓ **Beyond capacity of CGN**
- ✓ **Direct connectivity required**
  - Impossible to distinguish between internal and external systems
    - Intra-cloud
    - Inter-cloud
    - User-access
- ✓ **P2P potential**

## Always-on & Seamless

### Mobility

- ✓ **Seamless user experience**
- ✓ **Always Connected users**
  - Move from one access network to another
- ✓ **Cloud Abstraction**
- ✓ **Workload rebalancing**  
Virtual Machine relocation



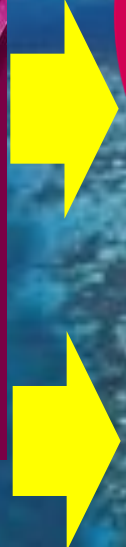
### Automatic Deployment

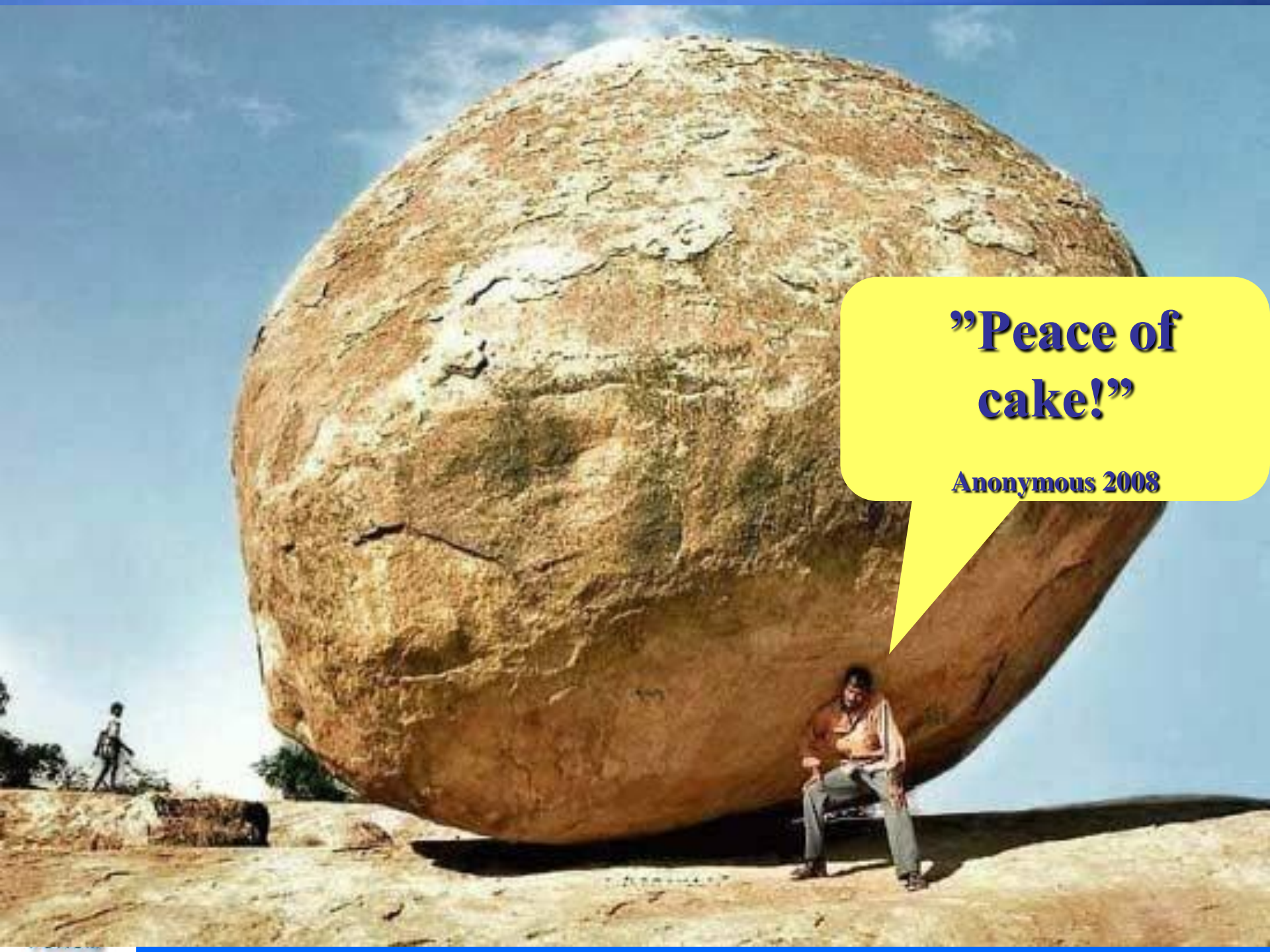
- ✓ **Ease of provisioning**
  - Stateless auto configuration
  - Dynamic renumbering
- ✓ **Dynamic allocation of capacity**
  - Auto configuring virtual machines based on demand fluctuation
- ✓ **Mandated encryption and authentication helps a lot in IPv6**



# Technological vision and ITU 2005 report on "Internet of Things"

ITU: again wrong on IPv6



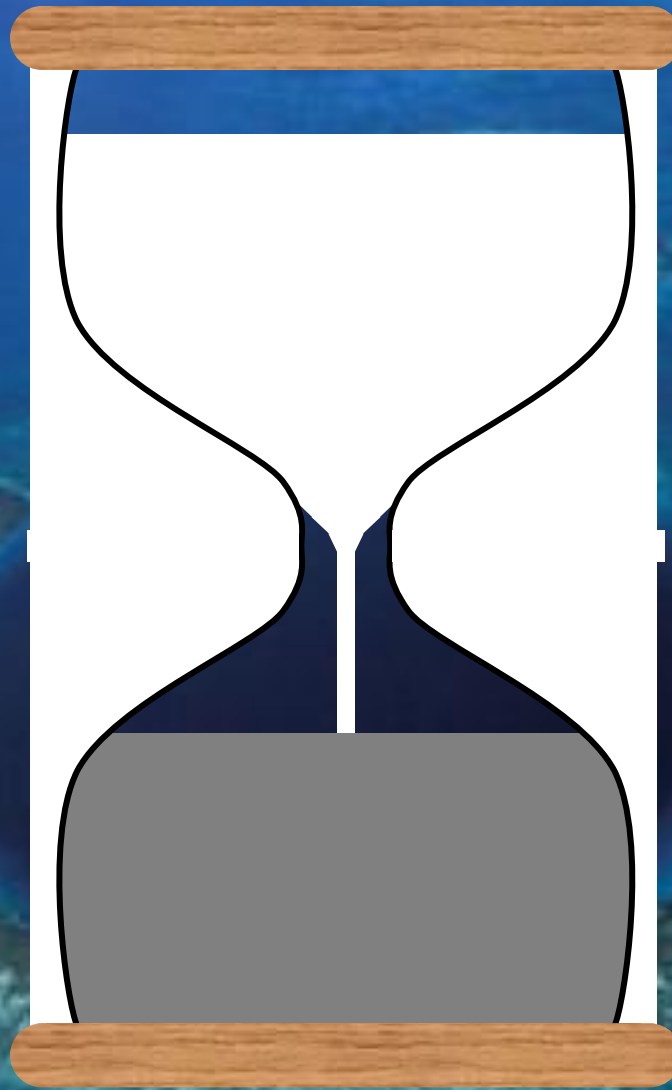


**”Peace of  
cake!”**

**Anonymous 2008**

# Only Time Will Tell...

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