Welcome!

Disruptive Weather Conditions: Clouds in the Forecast

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Your Host

Joel E. Welch
Director of Education
SMPTE
Today’s Guest Speaker

Richard Welsh
Co-founder and CEO
Sundog Media Toolkit Ltd
SMPTE International Governor

Cloud for media

- Defining “cloud”
- Architectures
- Practical use
- Challenges
- Where next?
Popular cloud

The genesis of cloud
The genesis of cloud

Basic Cloud Architecture

Real layers
Virtualising Layers

Compute

Store

Application

Server Hypervisor

Storage Hypervisor

Processing Units

Storage Units

CORE

CORE

CORE

CORE

Block

Block

Block

Block

Block
Compute Architecture

**Bare Metal**
- Application
- Operating System
- Server Hypervisor
- Processing Units
  - CORE
  - CORE
  - CORE
  - CORE

**Software**
- Application
- Operating System
- Server Hypervisor
- Processing Units
  - CORE
  - CORE
  - CORE
  - CORE

**Type 1**

**Type 2**

**Compute Architecture**

Resource Request = \[ n \text{ GHz} \] Processing

\[ \text{Processing Units} \]
- Virtual Core
- Virtual Core
- Virtual Core
- Virtual Core
Storage Architecture

Resource Request → Server Hypervisor → Storage Units

Files → Object Storage

Common Hypervisors

Bare Metal
Type 1

Software
Type 2

VMware vSphere
Windows Hyper-V
Citrix Xen
KVM
Service Deployment

Facility Network

Internet

PROFESSIONAL

PUBLIC

Compute

Storage

Provisioning Virtual Resource

$ Cost per TB/month

Total data size (TB)

Simple pricing
(Long Term/Short term/Faster/Slower)

$ Cost per Flop

Total Compute Resource (Flops)

Much more complex pricing
(CPU/GPU type, cache size, attached RAM)
Physical Security

Remote users

![Diagram of Physical Security](image)

Data Security

Remote users

![Diagram of Data Security](image)
Security

Remote users

Loose Coupled UI

Internet

Facility

Encrypted storage

Encrypted OS

Authenticated Requests

Content Network

Brick wall

Corporate Network

Loose Coupled UI

Multipoint Authentication

Authenticated Requests

Encrypted traffic

Content

User access

Access + proxy

Authenticated Requests

Encrypted OS

Machine segregation

Encrypted storage

Authenticated Requests

Encrypted traffic

Multipoint Authentication

Data Packet

Heartbeat

struct

HeartbeatMessage

{ type; uint16 payload_length; opaque payload[HeartbeatMessage.payload_length]; opaque padding[padding_length]; } HeartbeatMessage;

65535 bytes

1 byte

Heartbeat

Length

Payload

struct ssl3_record_st

{ unsigned int length; /* How many bytes available */
  unsigned char *data; /* pointer to the record data */
  } SSL3_RECORD;

Heartbleed

x.509

SSL handshake

SSL session

Jackpot = X.509

Pay out

• Passwords

• Messages

• Juicy Data

Over-run from sent payload byte into victim’s process memory

Data Packet

P

Data Packet

L

65535 bytes

1 byte
Heartbleed

- OpenSSL 1.0.1 through 1.0.1f (inclusive) are vulnerable
  - Released 1.0.1 on 14th of March 2012

- OpenSSL 1.0.1g is NOT vulnerable
  - Released on 7th of April 2014

- OpenSSL 1.0.0 branch is NOT vulnerable
- OpenSSL 0.9.8 branch is NOT vulnerable

Applications

- Asset management
- Collaborative Editing
- VFX Render
- Colour Engine
- Transcode
- Test & Measurement
- Playout

- Dailies
- Shoot
- Manage
- Edit
- VFX
- Grade
- Master
- QC
- Deliver
Challenges

Asset management  VFX Render  Transcode  Playout
Dailies  Collaborative Editing  Colour Engine  Test & Measurement

Bandwidth/ File Size  Single technical environment  Content Delivery Networks
Shoot  Manage  Edit  VFX  Grade  Master  QC  Deliver

Security  Workflow continuity  Application interoperability

Current Scenario

Dailies  Editing  Asset management
VFX Render Pro Cloud A  Transcode  Colour Engine Pro Cloud B
Public Cloud X  Test & Measurement Public Cloud Y  Playout
Shoot  Manage  Edit  VFX  Grade  Master  QC  Deliver
Future

Shoot    Manage    Edit    VFX    Grade    Master    QC    Deliver

Asset management    Collaborative Editing    VFX Render    Colour Engine    Transcode    Test & Measurement    Delivery

Control

Q & A

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