







# About Us

Established 1997 **Google Partner for 15 years**

**Employees** 400 Full Time, 250 Part Time / Contract

**Head Office** Emeryville, California (SF Bay Area)  
Offices in Southern California, New York, Denver, Boston,  
Toronto, London, Zurich, and Sydney.

**Key Industries** Broadcast, Film, Corporate Video, Education,  
Gaming, Government, House of Worship, Post-Production

**Expertise** Workflow solution design & engineering,  
Cloud Architecture. Storage Systems, Asset Management,  
Video & Audio Production – Pro Audio/video sales  
Systems Integration & Installation

**Managed Services + Staffing**

# What is **Cloud Production**?

**VPCR** stands for Virtual Production Control Room

A **complex** integration of equipment + disciplines.

The process of creating **real-time** content for broadcast or streaming using cloud compute + resources

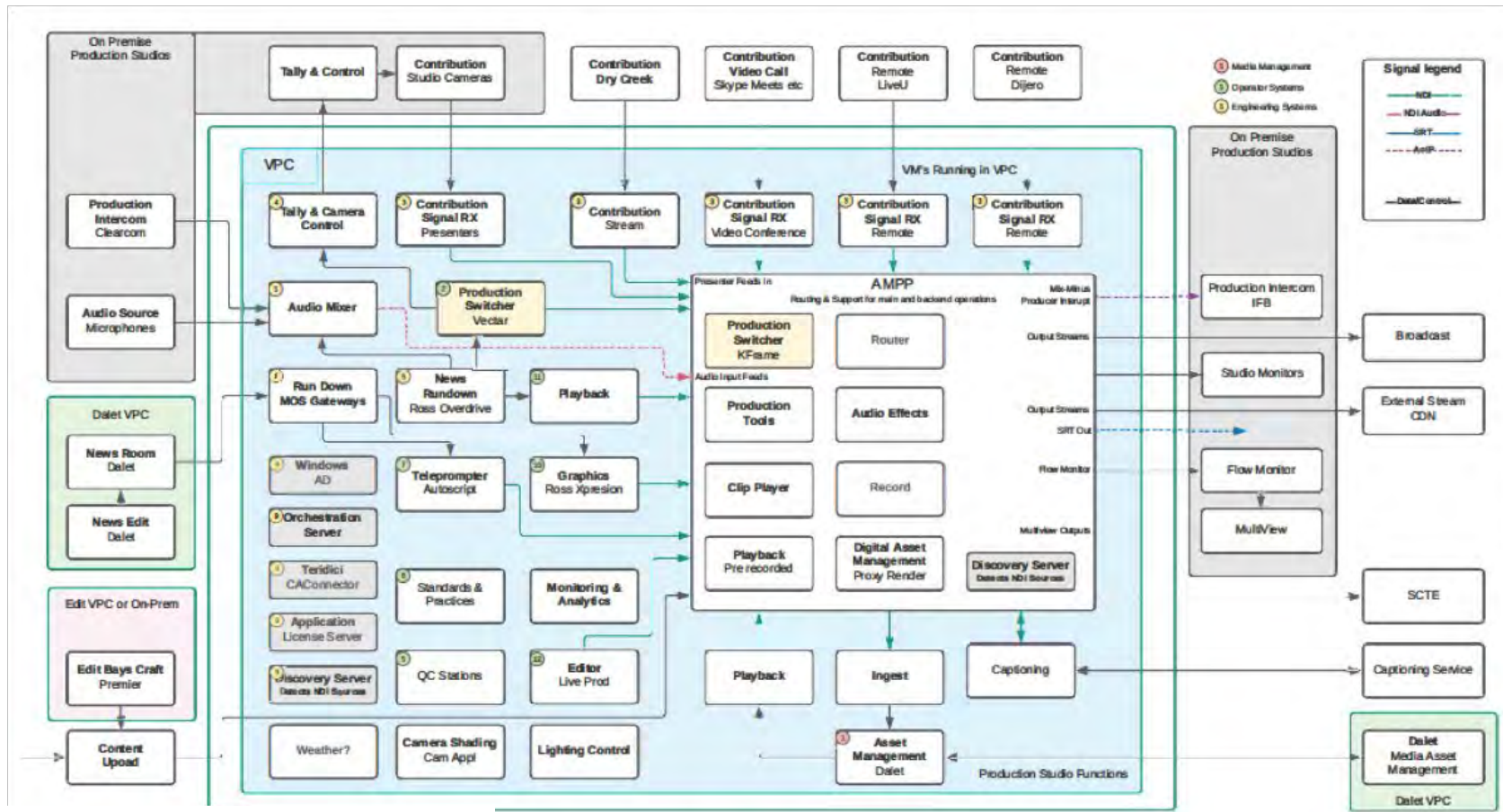
Producers, Presenters, Directors + Engineers collaborate **on-line**

The **hub** of Media production workflows that connects everything from ingest to CDN

Components differ from client to client to meet **workflow demands**

Enterprise level applications are **similar** to Production Control Rooms (PCR).

Tools, services + expertise are **never** provided by a single partner



**CONFIDENTIAL DATA - NOT FOR DISTRIBUTION**  
 Graphical Representation - Not for engineering use.

# Financial Analysis is far more complicated

Cost of Cloud Services is difficult to determine without building the entire environment and running it.

True consumption based calculations are very difficult

- Most Applications are not yet consumption based
- Very few applications are properly containerized for automated spin up and down

Much of the cost saving of “Cloud” is in turning it off when not in use.

- No standard for automation
- System dependencies are complicated
- The industry is not conditioned for on demand infrastructure (infrastructure as code)

GRASS VALLEY AMPP  
AMAZON WEB SERVICES

Include shared storage in total? (\$1028 p/m)		YES		Hourly Pricing							Hours/Day	Days/week	Years	
Virtual Machines				Discounts							3	7	1	
				Convertible No Up-Front							3yr CUD Totals			
				1,096	total hours, at selected pricing terms totals:						\$25,655.59			
Function	Application	24/7	Instance	vCPU	Mem	GPU	VPUs	GPU	On-Demand	1-year	3-year	Daily	Monthly	Yearly
Switcher	GV AMPP	<input type="checkbox"/>	g5.24xlarge	96	384	A100	1	4	\$35.38	\$29.02	\$23.41	\$92.08	\$3,836.72	\$45,968.61
Discovery	NDI SDK	<input checked="" type="checkbox"/>	t3.xlarge	4	16		1		\$8.17	\$8.12	\$8.08	\$1.92	\$58.44	\$781.28
Processing	SiennaND P.E.	<input type="checkbox"/>	m5.16xlarge	64	256		1		\$3.07	\$2.26	\$1.56	\$4.68	\$142.45	\$1,789.36
Audio Mixer	Harrison VBM	<input type="checkbox"/>	g4dn.2xlarge	8	32	T4	1	1	\$1.12	\$0.91	\$0.76	\$2.28	\$69.48	\$832.77
Closed Caps	EEG Alta	<input type="checkbox"/>	t3.xlarge	4	16		1		\$8.17	\$8.12	\$8.08	\$8.24	\$7.38	\$87.66
Rundown	Ross Inception	<input checked="" type="checkbox"/>	t3.xlarge	4	16		1		\$8.17	\$8.12	\$8.08	\$1.92	\$58.44	\$781.28
Audio Play	Media-Player	<input type="checkbox"/>	c5.large	2	4		1		\$8.18	\$8.15	\$8.13	\$8.39	\$11.87	\$142.45
Teleprompt	AutoScript	<input type="checkbox"/>	g4dn.xlarge	4	16	T4	1	1	\$8.71	\$8.57	\$8.46	\$1.38	\$42.08	\$584.84
Call-in	VC [generic]	<input type="checkbox"/>	g4dn.2xlarge	8	32	T4	4	1	\$4.48	\$3.64	\$3.84	\$9.12	\$277.59	\$3,331.87
Workstation	Workstation	<input type="checkbox"/>	g4dn.2xlarge	8	32	T4	2	1	\$2.24	\$1.82	\$1.52	\$4.56	\$138.79	\$1,665.53
Camera Feed	LiveU	<input type="checkbox"/>	c5.4xlarge	16	32		1		\$8.68	\$8.49	\$8.33	\$8.99	\$38.13	\$361.68
Playout	MOG MAN4PRO	<input type="checkbox"/>	g4dn.4xlarge	16	64	T4	1	1	\$1.94	\$1.61	\$1.36	\$4.08	\$124.18	\$1,498.22
Graphics	Ross Xpression	<input type="checkbox"/>	g4dn.4xlarge	16	64	T4	1	1	\$1.94	\$1.61	\$1.36	\$4.08	\$124.18	\$1,498.22
Editorial	Adobe Premiere	<input type="checkbox"/>	g4dn.4xlarge	16	64	T4	1	1	\$1.94	\$1.61	\$1.36	\$4.08	\$124.18	\$1,498.22
Ingest	MOG MAN4PRO	<input type="checkbox"/>	g4dn.4xlarge	16	64	T4	1	1	\$1.94	\$1.61	\$1.36	\$4.08	\$124.18	\$1,498.22
PCoIP	Teradici CAC	<input type="checkbox"/>	t3.xlarge	4	16		2		\$8.34	\$8.24	\$8.16	\$8.48	\$14.61	\$175.32
PCoIP Man	Teradici CAM	<input type="checkbox"/>	t3.xlarge	4	16		1		\$8.17	\$8.12	\$8.08	\$8.24	\$7.38	\$87.66
Bastion	Windows	<input checked="" type="checkbox"/>	t3.xlarge	4	16		1		\$8.24	\$8.19	\$8.16	\$3.84	\$116.88	\$1,482.56
Domain Ctl	AD-DC	<input checked="" type="checkbox"/>	m4.xlarge	4	16		1		\$8.38	\$8.33	\$8.28	\$6.72	\$284.54	\$2,454.48
Bastion	SSH [generic]	<input checked="" type="checkbox"/>	t3.xlarge	4	16		1		\$8.17	\$8.12	\$8.08	\$1.92	\$58.44	\$781.28
Licensing	Ross PM	<input checked="" type="checkbox"/>	t3.xlarge	4	16		1		\$8.17	\$8.12	\$8.08	\$1.92	\$58.44	\$781.28
SAN	AMS EBX	<input checked="" type="checkbox"/>	r5b.2xlarge	8	64		1		\$8.68	\$8.43	\$8.28	\$6.72	\$284.54	\$2,454.48

# Analyzing benefits

Our experience so far

- Cost benefits are small when analyzed against a 7 year CapEx depreciation in a single instance.
- The shorter the CapEx cycle the sooner you see cost benefits
- Multiple systems and centralization provide real cost savings

Significant technical benefits result from being able to iterate and innovate

- Continuous upgrade process
- Change “equipment” without physical changes

*Example: Change switcher from Vectar to K-Frame is a configuration change with no physical change or CapEx.*



# On-Prem Control



# Analyzing benefits



# System **Design** Considerations

First steps are the same as any other production system, it's all about desired functionality

Vetting Vendors against applications. Tests and POC's are required as everything is new. This substantially adds to engineering design time.

**No one worries** if a physical SDI switcher or router will **work together**.

VS

**How to connect** Vizrt's Vectar Plus into a Grass Valley AMPP infrastructure?

Few **infrastructure interconnect** choices exist today for **on-prem facility design**. SDI vs 2110, perhaps NDI.

How to implement these are well documented and a large pool of **experience guides design**.

Limited number of interconnect methods in cloud, and normal IP standards do not work

- Multicast is not implementable in Cloud today
- Look to use Cloud proven protocols
  - Video compression is a requirement
  - Use the best CODEC and protocol for each link

*An example might be that NDI will work within your VPC, however full bandwidth NDI is probably not the best contribution method.*

# Contribution + Egress

Will sources and destinations be mostly in Cloud?

- This simplifies transport and conversion
- Can add uncertainty to contribution sources.

Hybrid is complicated

- Required bidirectional signal conversion
- Adds complex latency that must be tested
- Low latency CODECs and transport protocols are required

# Control + Operational

Many applications require PCoIP desktop control, even if they are considered “Cloud Native” applications.

Applications with HTML based UI’s are lower cost to implement and allow you to skip “Remote Desktops”

If your operators are not in a single enterprise location how are operator connection challenges managed. Are redundant operators needed (COVID operations).

HTML UI’s are easier to implement

# Redundancy

This is not just about dual power supplies: Cloud offers a wide array of choices to consider:

- Connection redundancy for **operators**
- Connection redundancy for **signals**
- Standby VPCs in multiple regions. Live or rerouted Connections

Is “**Mult-Cloud**” a thing?

- Recent entire region outages
- What are your risk considerations vs costs
- How do you reconcile the differences in Cloud provider infrastructure
  - Each cloud does things differently
  - For maximum portability, limit use of Cloud provider specific tools.

# The System Integrator Role

While many application skills are similar, in Cloud infrastructure design is 100% dependent on new security, networking, deployment, automation and documentation practices.

Comprehensive Cloud compute and storage skills are required that very few Broadcast or A/V integrators have in house at scale.

**The value of a System Integrator is the same as always: Bringing experience in a given application and methods from working across a range of clients, broadcast vendors and now, the radical shift, Cloud service providers.**

# Contact Us



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